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PATENTS

July 2, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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THE UNIVERSITY OF MICHIGAN
AUG 26 1985
ENGINEERING LIBRARY

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

May 7, 1985.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on June 29, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,336,617 through 4,337,538

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,064,376, Re. S.N. 731,030, Filed May 6, 1985, Cl. 179/146H, SOUND REPRODUCTION SYSTEM AND DEVICE, Kyoto Yamada, Owner of Record: *Bodysonic Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: James C. Wray, Ex. Gp.: 261

4,223,349, Re. S.N. 732,033, Filed May 8, 1985, Cl. 369/050, SYSTEM FOR ROTATING AN INFORMATION STORAGE DISC AT A VARIABLE ANGULAR VELOCITY TO RECOVER INFORMATION THEREFROM AT A PRESCRIBED CONSTANT RATE, Wayne R. Dakin, et al, Owner of Record:

Discovision Associates, Costa Mesa, Calif., Attorney or Agent: Ronald J. Clark, Ex. Gp.: 235

4,284,629, Re. S.N. 733,996, Filed May 14, 1985, Cl. 424/246, PROCESS FOR THE PREPARATION OF 4-PYRIDONE-3-CARBOXYLIC ACIDS AND/OR DERIVATIVES THEREOF, Klaus Grohe, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 125

4,376,086, Re. S.N. 709,311, Filed May 1, 1985, Cl. 264/42, PROCESS FOR THE PRODUCTION OF CALCIUM SILICATE-CONTAINING STONE BLANKS USEFUL IN CONSTRUCTING BUILDING WALLS, Peter Shubert, et al., Owner of Record: *Sicowa Verfahrenstechnik fur Baustoffe GmbH & Co., kg, Handerweg, Germany,* Attorney or Agent: Donald K. Huber, et al., Ex. Gp.: 137

4,377,024, Re. S.N. 711,448, Filed Mar. 12, 1985, Cl. 029/157.3C, METHOD OF MAKING A HEAT EXCHANGER, Zalman P. Saperstein, Owner of Record: *Modine Manufacturing Co., Racine, Wis.*, Attorney or Agent: Wood, Dalton, et al., Ex. Gp.: 326

4,411,768, Re. S.N. 735,101, Filed May 17, 1985, Cl. 208/059, HYDROGENATION OF HIGH BOILING HYDROCARBONS, Harold Unger, et al., Owner of Record: *Lummus Crest, Inc., Bloomfield, N.J.*, Attorney or Agent: Elliot M. Olstein, Ex. Gp.: 116

4,413,147, Re. S.N. 734,433, Filed May 16, 1985, Cl. 568/476, CONVERSION OF ISOBUTANE TO METHACROLEIN, Sargis Khoobiar, Owner of Record: *The Halcon SD Group, Inc., New York, N.Y.*, Attorney or Agent: William C. Long, et al., Ex. Gp.: 126

4,455,314, Re. S.N. 734,496, Filed May 16, 1985, Cl. 514/194, PENICILLIN DERIVATIVES, George Burton, et al., Owner of Record: *Beecham Group P.L.C., Middlesex, England,* Attorney or Agent: Albert L. Jacobs, et al., Ex. Gp.: 125

Erratum

The Notice of Reissue Application Filed in regard to Patent No. 4,250,338, Re. S.N. 701,004, published in the Apr. 9, 1985 Official Gazette (1053 OG 32) is hereby rescinded. This application was found to be a duplicate of Re. S.N. 684,776 published on Mar. 19, 1985 (1052 OG 46). Serial No. 701,004 is deleted from all Patent and Trademark Office records.

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

United States Patent and Trademark Office
Before the Commissioner of Patents and Trademarks

Joseph F. Nakamura,

Solicitor, U.S. Patent and Trademark Office,

v.

Proceeding No. 84-2

Horace S. Harper, Jr., Respondent.

Notice by Publication

Notice is hereby given to the above named respondent, that proceedings under 35 U.S.C. §32 have been instituted against him. A copy of the *NOTICE OF PROCEEDINGS UNDER 35 U.S.C. §32,* including the charges against respondent, was twice mailed to the respondent's address of record. The notice was twice returned by the U.S. Postal Service.

Respondent may obtain a copy of the above-mentioned notice from:

Richard E. Schafer
Associate Solicitor
U.S. Patent and Trademark Office
P.O. Box 15667
Arlington, Va. 22215
(703) 557-4035

This notice will appear in the Official Gazette for four consecutive weeks beginning with the issue of June 11, 1985. Respondent has thirty days from the date of the last notice to file an answer to the charges against him. Failure to file an answer will be taken as an admission of the charges. 37 CFR §1.348 (c).

JOSEPH F. NAKAMURA,
Solicitor

By: RICHARD E. SCHAFER
Associate Solicitor.

Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of May 14, 1985, were listed inadvertently:

1,334,975	TM 155	May 14, 1985
1,335,033	TM 156	May 14, 1985
1,335,037	TM 156	May 14, 1985
1,335,085	TM 157	May 14, 1985
1,335,236	TM 160	May 14, 1985
1,335,292	TM 161	May 14, 1985
1,335,322	TM 162	May 14, 1985
1,335,326	TM 162	May 14, 1985
1,335,331	TM 162	May 14, 1985
1,335,332	TM 162	May 14, 1985
1,335,333	TM 162	May 14, 1985
1,335,463	TM 165	May 14, 1985
1,335,602	TM 168	May 14, 1985
1,335,618	TM 168	May 14, 1985
1,335,645	TM 169	May 14, 1985
1,335,736	TM 171	May 14, 1985
1,335,751	TM 171	May 14, 1985
1,335,878	TM 174	May 14, 1985
1,335,983	TM 176	May 14, 1985
1,335,985	TM 176	May 14, 1985

Consequently, the certificates of registration bearing the above identified registration numbers were not issued on the date indicated, and the registration numbers have been vacated.

June 3, 1985.

PATRICIA M. DAVIS,
Administrator for Trademark Operations.

Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of May 21, 1985, were listed inadvertently:

1,336,336	TM 177	May 21, 1985
1,336,938	TM 189	May 21, 1985

Consequently, the certificates of registration bearing the above-identified registration numbers were not issued on the date indicated, and the registration numbers have been vacated.

PATRICIA M. DAVIS,
Administrator for
Trademark Operations.

June 3, 1985.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Power-Soler, Inc., Wetumpka, Ala., Reg. No. 1,179,300, for the mark "FOOT DOC", Canc. No. 14,021.

American Feather Products Corp., assignee, by assignment and change of name, of American Feather Products, Chicago, Calif., Reg. No. 611,081, for the mark "TRI-LEVEL", Canc. No. 14,448.

Debbie L. Giampapa, dba, Mopheads, Sherman Oaks, Calif., Reg. No. 1,199,699, for the mark "MOP HEADS", Canc. No. 14,498.

Sol Fletcher, Inc., New York, N.Y., Reg. No. 514,804, for the mark "MAC HEATH", Canc. No. 14,567.

Glueck Women's Wear, Inc., assignee, of Odette Gluech, dba, A L'Etoile, New York, N.Y., Reg. No. 804,729, for the mark "A L'ETOILE", Canc. No. 14,612.

ERMA S. BROWN,
Administrator of the
Trademark Trial and
Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

DEPARTMENT OF COMMERCE

Patent and Trademark Office
37 CFR Part 1

[Docket No.]

Revision of Patent Fees

AGENCY: Patent and Trademark Office, Commerce

ACTION: Notice of Proposed Rulemaking

SUMMARY: The Patent and Trademark Office proposes to amend the rules of practice in patent cases, Part 1 of title 37, Code of Federal Regulations to adjust fee amounts. This action is necessary at this time because operating costs have increased over the past three years and the Commissioner is authorized by §41(f) of title 35, United States Code, to adjust fees established in §41(a) and §41(b) of title 35, United States Code, on October 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index. Fees for other processing, services or materials related to patents as provided by §41(d) and §376 of title 35, United States Code, are being adjusted to recover the estimated average cost to the Office of such processing, services or materials.

DATES: Comments must be submitted on or before July 18, 1985; a public hearing will be held on July 18, 1985, at 9:00 a.m. Requests to present oral testimony should be received on or before July 15, 1985.

ADDRESSES: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Frances Michalkewicz, Room CP3-11D27. The hearing will be held in Room 328, on the 3rd floor of Building 2, Crystal Mall, located at 1921 Jefferson Davis Highway, Arlington, Virginia. Written comments and a transcript of the public hearing will be available for public inspection in Room 11D27 of Building 3, Crystal Plaza at 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Frances Michalkewicz by telephone at (703) 557-1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: This proposed rule change is designed primarily to adjust patent fees because costs have increased and the Commissioner is authorized to (1) adjust statutory patent fees set forth in §41(a) and §41(b) of title 35, United States Code, to reflect fluctuations occurring during the previous three years in the Consumer Price Index, as authorized by §41(f) of title 35, United States Code, (2) adjust fees for processing, services, or materials related to patents which have been established by the Commissioner in accordance with §41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing, services or materials, and (3) adjust fees for filing and processing an application under the Patent Cooperation Treaty which have been established by the Commissioner to recover the cost of such processing in accordance with Section 376 of title 35, United States Code.

Adjustments to fees for filing and processing a trademark application and for other processing, services or materials related to trademarks are not being proposed at this time, pending review of trademark automation cost requirements.

BACKGROUND INFORMATION: Patent and Trademark Office fees are authorized by sections 41 and 376 of title 35, United State Code. Section 41(a) of title 35, United States Code, establishes a number of statutory fees. Among the more significant of these are fees for filing a patent application and issuing a patent. Certain other fees, such as appeal fees, the fee for filing a disclaimer, fees for filing petitions seeking to revive an abandoned application and for extensions of time also are set in §41(a) of title 35, United States Code. Section 41(b) of title 35, United States Code, sets forth the statutory fees for maintaining a patent in force if the application was filed on or after August 27, 1982.

The provisions of Public Law 96-517 also establish maintenance fees for applications other than design and plant patent applications filed on or after December 12, 1980 and before August 27, 1982. These maintenance fees are to recover 25 percent of the estimated cost to the Office of processing patent applications.

Section 1 of Public Law 97-247 authorized the reduction by 50 percent in the fees paid under §41(a) and §41(b) of title 35, United States Code, by independent inventors, small business concerns, and nonprofit organizations, who meet the definitions established. This authorization will expire on September 30, 1985. Legislation has been introduced to authorize this reduction for an additional three years. If such authority is not continued, the small entity reduction will be rescinded and appropriate amendments to the regulations will be made.

Section 41(f) of title 35, United States Code, provides that fees established in §41(a) and §41(b) of title 35, United States Code, "may be adjusted by the Commissioner on October 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor." Section 41(f) also provides that changes of less than one percent may be ignored.

Policy for applying the Consumer Price Index: The Department of Labor's Consumer Price Index is made public approximately twenty-one days after the end of the month being calculated. The time lag between the initiation and the completion of the rulemaking process dictates that the March through September 1985 inflation rate be projected. This estimate is included in the cumulative three-year CPI applied to patent fees. Before the final fee schedule is published, the estimate will be recalculated using the additional actual data that will have become available in the interim.

The Administration's projected cumulative CPI for the three-year (1982-1985) period is 11.7 percent. The Patent and Trademark Office has used the 11.7 percent projection in adjusting the fees established in §41(a) and §41(b) of title 35, United States Code.

After application of the 11.7 percent projected fluctuation in the Consumer Price Index to fees set forth in §41(a) and §41(b), amounts were rounded by applying standard arithmetical rules so

that the amounts rounded would be de minimus and convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees between $10 and $99 were rounded to the nearest even number so that the comparable small entity fee would be a whole number.

Section 41(d) of title 35, United States Code, provides that the "Commissioner will establish fees for all other processing, services, or materials related to patents" which are not covered in §41(a) and §41(b) of title 35, United States Code, "to recover the estimated average cost to the Office of such processing, services or materials."

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty. The fees under the Patent Cooperation Treaty are keyed to full cost recovery of the processing costs under the Treaty.

The general guidelines used by the Patent and Trademark Office in determining the non-statutory fees are set forth in OMB Circular A-25. Costs were determined from the best available records and included direct and indirect costs to the Office of carrying out the activity.

It is intended that the amount of any fee due and payable on or after October 1, 1985 is the amount set in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing, where authorized under §1.8 of title 37, Code of Federal Regulations, will be considered to be the date of receipt in the Office. A "Certificate of Mailing under §1.8" is not "proper" for items which are specifically excluded from the provisions of §1.8. Section 1.8 of title 37, Code of Federal Regulations, should be consulted for those items for which a Certificate of Mailing is not "proper". Such items include, inter alia, the filing of national and international applications for patents and the filing of trademark applications. The provisions of §1.10, relating to filing of papers and fees by "Express Mail" with certificate, however, do apply to any paper or fee (including patent and trademark applications) to be filed in the Office. If an application or fee is filed by "Express Mail" with a certificate of mailing dated October 1, 1985, the amount of the fee to be paid is the fee established herein if a change is being made in the fee.

In order to ensure clarity in the implementation of the fee proposals, a discussion of specific sections is set forth below:

DISCUSSION OF SPECIFIC RULES

Section 1.16 National application filing fees

Section 1.16, if revised as proposed, would adjust patent application filing fees established in §41(a) of title 35, United States Code and set forth in paragraphs (a)-(d) and (f)-(j) of this section to reflect fluctuations in the Consumer Price Index.

Section 1.16, paragraph (e), if revised as proposed, would adjust the patent application surcharge fee authorized by §111 of title 35, United States Code.

Section 1.17 Patent application processing fees

Section 1.17, if revised as proposed, would adjust patent application processing fees established in §41(a) of title 35, United States Code, and set forth in paragraphs (a)-(g), (l) and (m) of this section to reflect fluctuations in the Consumer Price Index.

Section 1.17, paragraphs (h)-(k), if revised as proposed, would adjust the patent application processing fees authorized by §41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing.

Section 1.18 Patent issue fees

Section 1.18, if revised as proposed, would adjust patent issue fees established in §41(a) of title 35, United States Code and set forth in paragraphs (a)-(c) of this section to reflect fluctuations in the Consumer Price Index.

Section 1.19 Document supply fees

Section 1.19, if revised as proposed, would adjust the fees authorized by §41(d) of title 35, United States Code for services and materials as set forth in paragraphs (a)-(c) of this section to recover the estimated average cost to the Office of the specified services and materials.

Section 1.19, paragraph (a) is proposed to be amended further to clarify the services and documents provided. It would provide for copies of specific documents at a flat fee. Copies of general Office records would be provided at a per page fee.

Section 1.19, paragraph (b) is proposed to be amended further to delete subparagraph (3). A flat fee for comparing and certifying copies of documents made from Office records is proposed in new paragraph (i) of this section.

Section 1.19, paragraph (c) is proposed to be amended further to provide for ten subclasses with the annual service charge.

Section 1.19, if revised as proposed, would provide in new paragraph (h) a $10 per document flat fee for an uncertified copy of a non-United States patent document. This fee would apply to copies of foreign patent applications such as those which are published at 18 months or when allowable for opposition.

Section 1.19, if amended as proposed, would provide in new paragraph (i) a flat fee for comparison and certification of each copy of a document made from Office records but not prepared by the Office.

Section 1.19, if amended as proposed, would provide in new paragraph (j) a fee for duplicate filing receipts and corrected filing receipts due to applicant error.

Section 1.20 Post-issuance fees

Section 1.20, paragraphs (b) and (c), if revised as proposed, would adjust patent post-issuance fees authorized by §41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing.

Section 1.20, paragraphs (d) and (h)-(j), if revised as proposed, would adjust patent post-issuance fees established in §41(a) and §41(b) of title 35, United States Code, to reflect fluctuations in the Consumer Price Index.

Section 1.20, paragraphs (e)-(g), if revised as proposed, would adjust post-issuance fees authorized by Section 2 of Public Law 96-517, as modified by Section 404 of Public Law 98-622. These fees must be set at a level to eventually recover 25 percent of the estimated cost to the Office of processing patent applications. In order to achieve this level of recovery, these maintenance fees are proposed to be adjusted to reflect fluctuations in the Consumer Price Index.

Section 1.20, paragraph (k), if revised as proposed, would adjust the patent application surcharge fee authorized by Section 2 of Public Law 96-517.

Section 1.20, paragraph (l), if revised as proposed, would adjust the post-issuance fee authorized by §41(b) of title 35, United States Code.

Section 1.21 Miscellaneous fees and charges

Section 1.21, if revised as proposed, would adjust the miscellaneous fees and charges authorized by §41(d) of title 35, United States Code and set forth in paragraphs (a), (b), (d)-(f), (h) and (i) of this section to recover the estimated average cost to the Office of such processing.

Section 1.21, paragraph (g), if revised as proposed, would change the term "copy machine tokens" to "copy share card."

Section 1.21, paragraph (k), if revised as proposed, would change the word "section" to "part" to clarify that any charge not provided for in these rules would be made at actual cost.

Section 1.21, if revised as proposed, would provide in new paragraph (m) a $20 fee for processing checks returned "unpaid" by a bank.

Section 1.24 Coupons

Section 1.24, if amended as proposed, would adjust the fee for the purchase of coupons for patents to make it comparable to the fee required for the purchase of U.S. patents.

Section 1.24, if amended as proposed, would also delete references to forty cent coupons which are no longer sold by the Patent and Trademark Office.

Section 1.25 Deposit accounts

Section 1.25, if amended as proposed, would establish a restricted subscription deposit account to be used exclusively for subscription orders of patent copies as issued. A minimum deposit of $300 is required to establish and maintain, without payment of a monthly service fee, a restricted subscription deposit account.

Section 1.26 Refunds

Section 1.26, if amended as proposed, would change paragraph (c) to provide for a refund of $1,300 if the Commissioner decides not to institute reexamination proceedings. The $1,300 refund would apply to those instances where the proposed reexamination fee of $1,800 under $1.20(c) was paid. The current $1,200 refund will be made in those cases where the current $1,500 reexamination fee was paid.

Section 1.297 Publication of statutory invention registration

Section 1.297, paragraph (b), if amended as proposed, would modify the statement to be printed on each statutory invention registration. The language of the statement is proposed to be modified so as to be more easily understood.

Section 1.445 International application filing and processing fees

Section 1.445, paragraphs (a)(1), (a)(2)(ii), (a)(3), and (a)(4), if amended as proposed, would adjust the fees authorized by §376 of title 35, United States Code, for international application processing to recover the estimated average cost to the Office of such processing. Rather than increasing the cost of the international search fee set forth in paragraph 1.445(a)(2)(i), which remains unchanged, an adjustment has been made in the amount credited by the Office in paragraphs 1.445(a)(2)(ii) and (a)(4).

Paragraph 1.445(a)(5), if amended as proposed, would adjust the surcharge authorized by §371(d) of title 35, United States Code.

Paragraph 1.445(a)(6), if amended as proposed, would adjust the processing fee for an English translation filed after 20 months from the priority date, authorized by §41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing.

Section 1.446 Refund of international application filing and processing fees.

Section 1.446, if amended as proposed, would delete paragraph (b). The substance of the deleted material is included in section 1.445, paragraph (a)(4).

OTHER CONSIDERATIONS: The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Public Law 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. There are no information collection requirements relating to patent fee rules.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the proposed rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Public Law 96-354). The principal impact of the major patent fees has already been taken into account in Public Law 97-247, which provided small entities with a 50 percent reduction in the major patent fees. Although that legislation will expire on September 30, 1985, legislation has been introduced to reauthorize the 50 percent reduction in patent fees for an additional three years. The proposed rule change will adjust fees to reflect the change

in the Consumer Price Index and cost of processing services as provided by statute (35 U.S.C. 41(d) and 41(f)).

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 41, and Public Laws 97-247 and 98-622, the Patent and Trademark Office is proposing to amend title 37 of the Code of Federal Regulations as set forth below. All proposed additions are printed between arrows and all deletions are shown between brackets.

1. Section 1.16 is proposed to be revised to read as follows:

§1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases:

By a small entity (§1.9(f))....[$150.00] ▶ $170.00 ◀

By other than a small entity...[$300.00] ▶ $340.00 ◀

(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§1.9(f))....[$15.00] ▶ $17.00 ◀

By other than a small entity....[$30.00] ▶ $34.00 ◀

(c) In addition to the basic filing fee in an original application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20. (Note that §1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes):

By a small entity (§1.9(f))....[$5.00] ▶ $6.00 ◀

By other than a small entity...[$10.00] ▶ $12.00 ◀

(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity ($1.9(f))....[$50.00] ▶ $55.00 ◀

By other than a small entity..[$100.00] ▶ $110.00 ◀

(If the additional fees required by paragraphs (b), (c) and (d) are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application:

By a small entity ($1.9(f))....[$50.00] ▶ $100.00 ◀

By other than a small entity..[$100.00] ▶ $200.00

(f) For filing each design application:

By a small entity $1.9(f))....[$62.50] ▶ $70.00 ◀

By other than a small entity..[$125.00] ▶ $140.00 ◀

(g) Basic fee for filing each plant application:

By a small entity ($1.9(f))...[$100.00] ▶ $110.00 ◀

By other than a small entity..[$200.00] ▶ $220.00 ◀

(h) Basic fee for filing each reissue application:

By a small entity ($1.9(f))...[$150.00] ▶ $170.00 ◀

By other than a small entity..[$300.00] ▶ $340.00 ◀

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity ($1.9(f))....[$15.00] ▶ $17.00 ◀

By other than a small entity...[$30.00] ▶ $34.00 ◀

(j) In addition to the basic filing fee in a reissue application; for filing or later

presentation of each claim (whether independent or dependent) in excess of 20 and also in excess of the number of claims in the original patent. (Note that §1.75(c) indicates how multiple dependent claims are considered for fee purposes):

By a small entity (§1.9(f))....[$5.00] ▶ $6.00 ◀

By other than a small entity..[$10.00] ▶ $12.00 ◀

(Note, see §1.445 for international application filing and processing fees).

2. Section 1.17 is proposed to be amended by revising paragraphs (a)-(m) to read as follows:

§1.17 Patent application processing fees.

(a) Extension fee for response within first month pursuant to §1.136(a):

By a small entity (§1.9(f))....[$25.00] ▶ $28.00 ◀

By other than a small entity...[$50.00] ▶ $56.00 ◀

(b) Extension fee for response within second month pursuant to §1.136(a):

By a small entity (§1.9(f))....[$75.00] ▶ $85.00 ◀

By other than a small entity..[$150.00] ▶ $170.00 ◀

(c) Extension fee for response within third month pursuant to §1.136(a):

By a small entity (§1.9(f))...[$175.00] ▶ $195.00 ◀

By other than a small entity..[$350.00] ▶ $390.00 ◀

(d) Extension fee for response within fourth month pursuant to §1.136(a):

By a small entity (§1.19(f))..[$275.00] ▶ $305.00 ◀

By other than a small entity..[$550.00] ▶ $610.00 ◀

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§1.9(f))....[$57.50] ▶ $65.00 ◀

By other than a small entity..[$115.00] ▶ $130.00 ◀

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§1.9(f))....[$57.50] ▶ $65.00 ◀

By other than a small entity..[$115.00] ▶ $130.00 ◀

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. 134:

By a small entity (§1.9(f))....[$50.00] ▶ $55.00 ◀

By other than a small entity..[$100.00] ▶ $110.00 ◀

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph.....[$120.00] ▶ $150.00 ◀

§1.47 - for filing by other than all the inventors or a person not the inventor.

§1.48 - for correction of inventorship.

§1.182 - for decision on questions not specifically provided for.

§1.183 - to suspend the rules.

§1.295 - for review of refusal to publish a statutory invention registration.

§1.377 - for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.

§1.378(e) - for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent.

§1.644(e) - for petition in an interference.

§1.644(f) - for request for reconsideration of a decision on petition in an interference.

§1.666(c) - for late filing of interference settlement agreement.

§§5.12, 5.13, & 5.14 - for expedited handling of foreign filing license.

§5.15 - for changing the scope of a license.

§5.25 - for retroactive license.

(i) For filing a petition to the Commissioner under a section of this part

listed below which refers to this paragraph.....[$60.00] ▶ $80.00 ◀

$1.12 - for access to an assignment record.

$1.14 - for access to an application.

$1.55 - for entry of late priority papers.

$1.102 - to make application special.

$1.103 - to suspend action in application.

$1.177 - for divisional reissues to issue separately.

$1.312 - for amendment after payment of issue fee.

$1.313 - to withdraw an application from issue.

$1.314 - to defer issuance of a patent.

$1.334 - for patent to issue to assignee, assignment recorded late.

$1.666(b) - for access to interference settlement agreement.

(j) For filing a petition to institute a public use proceeding under $1.292..... .....[$750.00] ▶ $950.00 ◀

(k) For processing an application filed with a specification in a non-English language ($1.52(d))....[$20.00] ▶ $100.00 ◀

(l) For filing a petition (1) for the revival of an abandoned application under 35 U.S.C. 133, or (2) for delayed payment of the issue fee under 35 U.S.C. 151:

By a small entity ($1.9(f))....[$25.00] ▶ $28.00 ◀

By other than a small entity...[$50.00] ▶ $56.00 ◀

(m) For filing a petition (1) for revival of an unintentionally abandoned application or (2) for the unintentionally delayed payment of the fee for issuing a patent:

By a small entity ($1.19(f))..[$250.00] ▶ $280.00 ◀

By other than a small entity..[$500.00] ▶ $560.00 ◀

3. Section 1.18 is proposed to be revised to read as follows:

§1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§1.9(f))...[$250.00] ▶ $280.00 ◀

By other than a small entity..[$500.00] ▶ $560.00 ◀

(b) Issue fee for issuing a design patent:

By a small entity (§1.9(f))....[$87.50] ▶ $100.00 ◀

By other than a small entity..[$175.00] ▶ $200.00 ◀

(c) Issue fee for issuing a plant patent:

By a small entity (§1.9(f))...[$125.00] ▶ $140.00 ◀

By other than a small entity..[$250.00] ▶ $280.00 ◀

4. Section 1.19 is proposed to be amended by revising paragraphs (a)(1-5), (b) and (c), and by adding new paragraphs (a)(7), and (h)-(j) to read as follows:

§1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Office documents:

(1) Printed copy of a patent, including a design patent, statutory invention registration, or defensive publication document, except color plant patent ▶ or color statutory invention registration ◀ .....[$1.00] ▶ $1.50 ◀

(2) Printed copy of a plant patent ▶ or statutory invention registration ◀ in color.....$8.00

(3) Copy of patent application as filed [, each 50 pages or fraction thereof].....[$18.00] ▶ $25.00 ◀

(4) Copy of patent file wrapper and contents, [each 100] ▶ up to 200 ◀ pages [or fraction thereof]....[$30.00] ▶ $75.00 ◀
▶ 201 pages and over ◀ ▶ $350.00 ◀

(5) Copy of Office records, except as ▶ otherwise ◀ provided in [paragraphs (a)(1) through (4) of] this section, per page.....[$0.30] ▶ $1.00 ◀

▶ (7) Copy of patent assignment record $5.00 ◀

(b) Certified copies of Office documents:

(1) For certifying Office records, per certificate.....[$3.50] ▶ $5.00 ◀

(2) For a search of assignment records, abstract of title and certification, per patent.....[$12.00] ▶ $15.00 ◀

[(3) For comparing copies, made from Patent and Trademark Office records but not prepared by the Patent and Trademark Office, with the original, prior to certification of the copies, per page .....[$0.10]]

(c) Subscription services:

(1) Subscription orders for printed copies of patents as issued, annual service charge for entry of order and [one subclass] ▶ ten subclasses ◀ .....[$4.00] ▶ $8.00 ◀

(2) For annual subscription to each additional subclass in addition to the [one] ▶ ten ◀ covered by the fee under paragraph (c)(1) of this section, per subclass .....[$0.40] ▶ $.70 ◀

* * * * *

▶ (h) Uncertified copy of a non-United States patent document, per document..... $10.00 ◀

▶ (i) Compare and certify copies made from Patent and Trademark Office records but not prepared by the Patent and Trademark Office, per copy of document..... $15.00 ◀

▶ (j) Additional filing receipts

Duplicate..... $20.00
Corrected due to applicant error..... $20.00 ◀

5. Section 1.20 is proposed to be amended by revising paragraphs (b) - (l) to read as follows:

§1.20 Post-issuance fees.

* * * * *

(b) Petition for correction of inventorship in patent (§1.324).....[$120.00] ▶ $150.00 ◀

(c) For filing a request for reexamination (§1.510(a)).....[$1,500.00] ▶ $1,800.00 ◀

(d) For filing each statutory disclaimer (§1.321):

By a small entity (§1.9(f))....[$25.00] ▶ $28.00 ◀

By other than a small entity...[$50.00] ▶ $56.00 ◀

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant .....[$200.00] ▶ $225.00 ◀

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant .....[$400.00] ▶ $445.00 ◀

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant .....[$600.00] ▶ $670.00 ◀

(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after August 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f))...[$200.00] ▶ $225.00 ◀

By other than a small entity..[$400.00] ▶ $450.00 ◀

(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after August 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f))...[$400.00] ▶ $445.00 ◀

By other than a small entity..[$800.00] ▶ $890.00 ◀

(j) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after August 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§1.9(f))...[$600.00] ▶ $670.00 ◀

By other than a small entity.[$1200.00] ▶ $1,340.00 ◀

(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after December 12, 1980 and before August 27, 1982.....[$100.00] ▶ $200.00 ◀

(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after August 27, 1982:

By a small entity (§1.9(f))....[$50.00] ▶ $100.00 ◀

By other than a small entity..[$100.00] ▶ $200.00 ◀

* * * * *

6. Section 1.21 is proposed to be amended by revising paragraphs (a), (b), (d)-(g), (h)(1), (i) and (k), and adding a new paragraph (m) to read as follows:

§1.21 Miscellaneous fees and charges.

The Patent and Trademark Office has established the following fees for the services indicated:

(a) Registration of attorneys and agents:

(1) For admission to examination for registration to practice, fee payable upon application.....[$75.00] ▶ $250.00 ◀

(2) On registration to practice .....[$50.00] ▶ $100.00 ◀

(3) For reinstatement to practice $25.00

(4) For certificate of good standing as an attorney or agent..... ▶ $25.00 ◀
▶ Suitable for framing ◀ ...[$10.00] ▶ $100.00 ◀

(5) For review of a decision of the Director of Enrollment and Discipline under §10.2(c).....[$60.00] ▶ $100.00 ◀

(6) For requesting regrading of an examination under §10.7(c).....[$60.00] ▶ $100.00 ◀

(b) Deposit accounts:

(1) For establishing or reinstating a deposit account.....$10.00

(2) Service charge for each month when the balance at the end of the month is below $1,000.....[$2.00] ▶ $20.00 ◀

▶ (3) Service charge for each month when the balance at the end of the month is below $300 for restricted subscription deposit accounts used exclusively for subscription order of patent copies as issued..... $20.00 ◀

* * * * *

(d) Delivery box: Local delivery box rental, per annum.....[$24.00] ▶ $60.00 ◀

(e) International-type search reports: For preparing an international-type search report of an international-type search made at the time of the first action on the merits in a national patent application.....[$25.00] ▶ $35.00 ◀

(f) Search of Office records: For searching Patent and Trademark Office records for purposes not otherwise specified, per one-half hour or fraction thereof .....[$10.00] ▶ $15.00 ◀

(g) Copy [machine tokens] ▶ share card ◀ : [Token for copying machine, each] ▶ Cost per copy ◀ $0.20

(h) Recording of documents:

(1) For recording each assignment, agreement or other paper relating to the property in a patent or application .....$20.00 ▶ $25.00 ◀

* * *

(i) Publication in Official Gazette: For publication in the Official Gazette of a notice of the availability of an application or a patent for licensing or sale, each application or patent .....[$6.00] ▶ $8.00 ◀

* * * * *

(k) For items and services, that the Commissioner finds may be supplied, for which fees are not specified by statute or by this [section] ▶ part ◀ , such charges as may be determined by the

Commissioner with respect to each such item or service .....actual cost

* * * * *

▶ (m) For processing each check returned "unpaid" by a bank..... $20.00 ◀

7. Section 1.24 is proposed to be revised to read as follows:

§1.24 Coupons

Coupons in denominations of [forty cents and] one dollar ▶ for the purchase of trademark registrations and one dollar and fifty cents for the purchase of patents, designs, defensive publications, and statutory invention registrations ◀ are sold by the Patent and Trademark Office for the convenience of [regular purchasers of U.S. patents and trademark registrations] ▶ the general public ◀ ; these coupons may not be used for any other purpose. [The 40-cent coupons are sold individually and in books of 50 with stubs for record for $20.] The one dollar coupons are sold individually and in books of 50 with stubs for record for $50 ▶ and the one dollar and fifty cent coupons are sold individually and in books of 50 with stubs for record for $75 ◀ . These coupons are good until used; they may be transferred but cannot be redeemed.

8. Section 1.25, paragraph (a), is proposed to be revised to read as follows:

§1.25 Deposit accounts

(a) For the convenience of attorneys, and the general public in paying any fees due, in ordering services offered by the Office, copies of records, etc., deposit accounts may be established in the Patent and Trademark Office upon payment of the fee for establishing a deposit account (§1.21(b)(1)). A minimum deposit of $1,000 [or more, depending on the activity of the individual account,] is required ▶ for paying any fees due or in ordering any services offered by the Office. However, a minimum deposit of $300 may be paid to establish a restricted subscription deposit account used exclusively for subscription order of patent copies as issued. ◀ At the [close] ▶ end ◀ of each month['s business], a ▶ deposit account ◀ statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit [value]. An amount sufficient to cover all fees, services, copies, etc., requested must always be on deposit. ▶ Charges to accounts with insufficient funds will not be accepted. ◀ A service charge (§1.21(b)(2)) will be assessed for each month

that the balance at the end of the month is below $1,000. ▶ For restricted subscription deposit accounts, a service charge ($1.21(b)(3)) will be assessed for each month that the balance at the end of the month is below $300. ◀

* * * * *

9. Section 1.26 is proposed to be amended by revising paragraph (c) to read as follows:

§1.26 Refunds.

* * * * *

(c) If the Commissioner decides not to institute a reexamination proceeding, a refund of [$1,200.00] ▶ $1,300 ◀ will be made to the requester of the proceeding. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

10. Section 1.297, paragraph (b), is proposed to be revised to read as follows:

§1.297 Publication of statutory invention registration.

* * * * *

(b) Each statutory invention registration published will include a statement relating to the attributes of a statutory invention registration. The statement will read as follows:

A statutory invention registration [published pursuant to 35 U.S.C. 157] is not a patent [but it has all of the attributes specified for patents in title 35, United States Code, except those specified in 35 U.S.C. 183 and sections 271 through 289]. [A statutory invention registration does not have any of the attributes specified for patents in any other provision of law other than title 35, United States Code. The invention with respect to which a statutory invention registration is published is not a patented invention for purposes of the marking provisions of 35 U.S.C. 292.] ▶ It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157. ◀

11. Section 1.445 is proposed to be amended by revising paragraph (a) to read as follows:

§1.445 International application filing and processing fees.

(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14).....[$125.00] ▶ $180.00 ◀

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

(i) No corresponding prior United States national application with fee has been filed..... $500.00

(ii) Corresponding prior United States national application with fee has been filed.....[$250.00] ▶ $330.00 ◀

(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2) ▶ , per additional invention ◀ .....[1] [$125.00] ▶ $150.00 ◀

(4) The national fee, that is, the amount set forth as the filing fee under §1.16(a) through (d) credited ▶ , if requested at the time of filing, ◀ by an amount of [$250] ▶ $170.00 ◀ where an international search fee [of $500.00] ▶ as required by paragraph (a)2(i) of this section ◀ has been paid on the corresponding international application to the United States Patent and Trademark Office as an International Searching Authority. [Where the amount of the credit is in excess of that required for the national fee, a request for a refund of the excess under §1.446(b) may be filed at the time of paying the national fee.] Only one such credit is permitted based on a single [$500.00] international search fee.

(5) Surcharge for filing the national fee or oath or declaration later than 20 months from the priority date.[$100.00] ▶ $200.00 ◀

(6) For filing an English translation of an international application later than 20 months after the priority date (§1.61(b))....[$20.00] ▶ $100.00 ◀

* * * * *

[1 Per additional invention]

12. Section 1.446 is proposed to be amended by removing paragraph (b):

§1.446 Refund of international application filing and processing fees.

(b) [Refund of a portion of the search fee toward payment of the national fee may be made one time to the extent set forth in §1.445(a)(4) if requested at the time of paying the national fee provided that a $500 search fee has been paid.] ▶ [Removed] ◀

* * * * *

6-18-85
Date

Donald J. Quigg
Acting Commissioner
of Patents and Trademarks

TABLE OF OFFICIAL GAZETTE VOLUME NUMBERS: 1872–1990

A table which relates volume numbers of the Official Gazette comprising collections of weekly issues of that publication to the month of their publication has found good use in the Patent and Trademark Office and Patent Depository Libraries in a variety of applications. The need for such a table arises, in part, from the fact that Official Gazette volumes have not been uniformly numbered on a monthly basis over the 110 year history of that publication. From Jan. 1872 through June 1883, they were numbered on a semi-annual basis; from July 1883 through Dec. 1902, quarterly; from Jan. 1902 through Dec. 1908, bi-monthly; and, since Jan. 1909, the volume of issues for each month has been separately numbered. To fulfill the interest which has been expressed in this table, it is published below:

Calendar Table of Official Gazette Volume Numbers

Month-by-Month Volume Numbers: Jan. 1872 to Present

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1872*	1	1	1	1	1	1	2	2	2	2	2	2
1873	3	3	3	3	3	3	4	4	4	4	4	4
1874	5	5	5	5	5	5	6	6	6	6	6	6
1875	7	7	7	7	7	7	7	8	8	8	8	8
1876	9	9	9	9	9	9	10	10	10	10	10	10
1877	11	11	11	11	11	11	12	12	12	12	12	12
1878	13	13	13	13	13	13	14	14	14	14	14	14
1879	15	15	15	15	15	15	16	16	16	16	16	16
1880	17	17	17	17	17	17	18	18	18	18	18	18
1881	19	19	19	19	19	19	20	20	20	20	20	20
1882	21	21	21	21	21	21	22	22	22	22	22	22
1883*	23	23	23	23	23	23	24	24	24	25	25	25
1884	26	26	26	27	27	27	28	28	28	29	29	29
1885	30	30	30	31	31	31	32	32	32	33	33	33
1886	34	34	34	35	35	35	36	36	36	37	37	37
1887	38	38	38	39	39	39	40	40	40	41	41	41
1888	42	42	42	43	43	43	44	44	44	45	45	45
1889	46	46	46	47	47	47	48	48	48	49	49	49
1890	50	50	50	51	51	51	52	52	52	53	53	53
1891	54	54	54	55	55	55	56	56	56	57	57	57
1892	58	58	58	59	59	59	60	60	60	61	61	61
1893	62	62	62	63	63	63	64	64	64	65	65	65
1894	66	66	66	67	67	67	68	68	68	69	69	69
1895	70	70	70	71	71	71	72	72	72	73	73	73
1896	74	74	74	75	75	75	76	76	76	77	77	77
1897	78	78	78	79	79	79	80	80	80	81	81	81
1898	82	82	82	83	83	83	84	84	84	85	85	85
1899	86	86	86	87	87	87	88	88	88	89	89	89
1900	90	90	90	91	91	91	92	92	92	93	93	93
1901	94	94	94	95	95	95	96	96	96	97	97	97
1902	98	98	98	99	99	99	100	100	100	101	101	101
1903*	102	102	103	103	104	104	105	105	106	106	107	108
1904	108	108	109	109	110	110	111	111	112	112	113	113
1905	114	114	115	115	116	116	117	117	118	118	119	119
1906	120	120	121	121	122	122	123	123	124	124	125	125
1907	126	126	127	127	128	128	129	129	130	130	313	131
1908	132	132	133	133	134	134	135	135	136	136	137	137
1909*	138	139	140	141	142	143	144	145	146	147	148	149
1910	150	151	152	153	154	155	156	157	158	159	160	161
1911	162	163	164	165	166	167	168	169	170	171	172	173
1912	174	175	176	177	178	179	180	181	182	183	184	185
1913	186	187	188	189	190	191	192	193	194	195	196	197
1914	198	199	200	201	202	203	204	205	206	207	208	209
1915	210	211	212	213	214	215	216	217	218	219	220	221
1916	222	223	224	225	226	227	228	229	230	231	232	233
1917	234	235	236	237	238	239	240	241	242	243	244	245
1918	246	247	248	249	250	251	252	253	254	255	256	257
1919	258	259	260	261	262	263	264	265	266	267	268	269
1920	270	271	272	273	274	275	276	277	278	279	280	281
1921	282	283	284	285	286	287	288	289	290	291	292	293
1922	294	295	296	297	298	299	300	301	302	303	304	305
1923	306	307	308	309	310	311	312	313	314	315	316	317
1924	318	319	320	321	322	323	324	325	326	327	328	329
1925	330	331	332	333	334	335	336	337	338	339	340	341

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Month-by-Month Volume Numbers: Jan. 1872 to Present—Continued

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1926	342	434	344	345	346	347	348	349	350	351	352	353
1927	354	355	356	357	358	359	360	361	362	363	364	365
1928	366	367	368	369	370	371	372	373	374	375	376	377
1929	378	379	380	381	382	383	384	385	386	387	388	389
1930	390	391	392	393	394	395	396	397	398	399	400	401
1931	402	403	404	405	406	407	408	409	410	411	412	413
1932	414	415	416	417	418	419	420	421	422	423	424	425
1933	426	427	428	429	430	431	432	433	434	435	436	437
1934	438	439	440	441	442	443	444	445	446	447	448	449
1935	450	451	452	453	454	455	456	457	458	459	460	461
1936	462	463	464	465	466	467	468	469	470	471	472	473
1937	474	475	476	477	478	479	480	481	482	483	484	485
1938	486	487	488	489	490	491	492	493	494	495	496	497
1939	498	499	500	501	502	503	504	505	506	507	508	509
1940	510	511	512	513	514	515	516	517	518	519	520	521
1941	522	523	524	525	526	527	528	529	530	531	532	533
1942	534	535	536	537	538	539	540	541	542	543	544	545
1943	546	547	548	549	550	551	552	553	554	555	556	557
1944	558	559	560	561	562	563	564	565	566	567	568	569
1945	570	571	572	573	574	575	576	577	578	579	580	581
1946	582	583	584	585	586	587	588	589	590	591	592	593
1947	594	595	596	597	598	599	600	601	602	603	604	605
1948	606	607	608	609	610	611	612	613	614	615	616	617
1949	618	619	620	621	622	623	624	625	626	627	628	629
1950	630	631	632	633	634	635	636	637	638	639	640	641
1951	642	643	644	645	646	647	648	649	650	651	652	653
1952	654	655	656	657	658	659	660	661	662	663	664	665
1953	666	667	668	669	670	671	672	673	674	675	676	677
1954	678	679	680	681	682	683	684	685	686	687	688	689
1955	690	691	692	693	694	695	696	697	698	699	700	701
1956	702	703	704	705	706	707	708	709	710	711	712	713
1957	714	715	716	717	718	719	720	721	722	723	724	725
1958	726	727	728	729	730	731	732	733	734	735	736	737
1959	738	739	740	741	742	743	744	745	746	747	748	749
1960	750	751	752	753	754	755	756	757	587	759	760	761
1961	762	763	764	765	766	767	768	769	770	771	772	773
1962	774	775	776	777	778	779	780	781	782	783	784	785
1963	786	787	788	789	790	791	792	793	794	795	796	797
1964	798	799	800	801	802	803	804	805	806	807	808	809
1965	810	811	812	813	814	815	816	817	818	819	820	821
1966	822	823	824	825	826	827	828	829	830	831	832	833
1967	834	835	836	837	838	839	840	841	842	843	844	845
1968	846	847	848	849	850	851	852	853	854	855	856	857
1969	858	859	860	861	862	863	864	865	866	867	868	869
1970	870	871	872	873	874	875	876	877	878	879	880	881
1971	882	883	884	885	886	887	888	889	890	891	892	893
1972	894	895	896	897	898	899	900	901	902	903	904	905
1973	906	907	908	909	910	911	912	913	914	915	916	917
1974	918	919	920	921	922	923	924	925	926	927	928	929
1975	930	931	932	933	934	935	936	937	938	939	940	941
1976	942	943	944	945	946	947	948	949	950	951	952	953
1977	954	955	956	957	958	959	960	961	962	963	964	965
1978	966	967	968	969	970	971	972	973	974	975	976	977
1979	978	979	980	981	982	983	984	985	986	987	988	989
1980	990	991	992	993	994	995	996	997	998	999	1000	1001
1981	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013
1982	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025
1983	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037
1984	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049
1985	1050	1051	1052	1053	1054	1056	1057	1058	1059	1060	1061	1062
1986	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074
1987	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086
1988	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098
1989	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110
1990	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122

• **SUMMARY OF CHANGES IN VOLUME NUMBERING:**

Semi-annual: *Jan. 1872 through Jun. 1883*
Quarterly: *Jul. 1883 through Dec. 1902*
Bi-monthly: *Jan. 1903 through Dec. 1908*
Monthly: *Jan. 1909 to the present*

The *Official Gazette* was published on successive Wednesdays from 3 Jan. 1872 through 17 Jan. 1872. From 23 Jan. 1872 to the present, it has been published weekly on Tuesday.

PATENT NOTICES

Certificates of Correction for the Week of July 2, 1985

Re. 30,659	4,467,011	4,480,963	4,494,967
Re. 31,664	4,467,949	4,481,091	4,495,210
Re. 31,803	4,468,112	4,481,799	4,495,490
4,083,980	4,469,070	4,482,462	4,495,708
4,200,765	4,469,853	4,483,131	4,495,735
4,349,532	4,471,022	4,483,764	4,496,595
4,369,060	4,471,346	4,484,001	4,496,633
4,388,540	4,471,496	4,484,008	4,497,128
4,395,763	4,472,097	4,484,233	4,497,493
4,403,087	4,472,381	4,484,377	4,497,614
4,407,060	4,472,750	4,484,409	4,497,649
4,410,793	4,473,908	4,484,428	4,497,685
4,415,722	4,474,653	4,484,754	4,498,081
4,418,003	4,474,746	4,485,397	4,498,156
4,418,242	4,475,342	4,486,351	4,498,262
4,418,826	4,475,388	4,486,770	4,498,602
4,419,123	4,475,400	4,486,797	4,498,622
4,422,962	4,475,566	4,487,846	4,499,150
4,424,392	4,475,718	4,487,982	4,499,159
4,425,650	4,475,951	4,488,224	4,499,359
4,428,948	4,476,440	4,488,384	4,499,410
4,431,536	4,476,579	4,488,475	4,499,703
4,431,814	4,476,897	4,489,006	4,500,127
4,435,443	4,476,926	4,489,779	4,500,526
4,436,125	4,477,275	4,490,241	4,500,659
4,436,560	4,477,301	4,490,824	4,500,945
4,436,730	4,477,329	4,491,479	4,501,314
4,438,091	4,477,360	4,491,820	4,501,526
4,438,272	4,477,509	4,491,950	4,502,333
4,440,754	4,477,841	4,492,255	4,503,383
4,442,399	4,477,944	4,492,292	4,503,994
4,448,908	4,477,970	4,492,642	4,505,646
4,452,790	4,478,012	4,492,822	4,505,740
4,457,522	4,478,386	4,494,257	4,506,426
4,460,481	4,479,819	4,494,300	4,508,905
4,460,681	4,480,226	4,494,473	
4,464,686	4,480,734	4,494,507	
4,466,299	4,480,759	4,494,606	

Disclaimers

4,352,212.—*David J. Greene,* Boston, Mass. and *Peter S. Walker,* Ridgewood, N.J. JOINT PROSTHESIS. Patent dated Oct. 5, 1982. Disclaimer filed Apr. 29, 1985, by the assignee, *Howmedica, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 21, 22, 23, 27, 28, 29, 30 and 31 of said patent.

4,416,444.—*Jerome S. Brower,* Pomona, Calif. UNDERWATER CUTTING ROD. Patent dated Nov. 22, 1983. Disclaimer filed May 13, 1985, by the inventor.

Hereby enters this disclaimer to the remaining term of said patent.

4,445,521.—*Jean-Francois Grollier; Claire Fiquet; Chantal Fourcadier,* Paris and *Claude Dubief,* Versailles; and *Daniele Cauwet,* Crosne, France. COMPOSITION AND PROCESS FOR THE TREATMENT OF KERATIN MATERIALS WITH POLYMER. Patent dated May 1, 1984. Disclaimer filed Apr. 10, 1985, by the assignee, *L'Oreal.*

Hereby enters this disclaimer to claims 26 to 30 of said patent.

4,463,310.—*George J. Whitley,* Philadelphia, Pa. APPARATUS FOR DETECTING THE PRESENCE OF COMPONENTS ON A PRINTED CIRCUIT BOARD. Patent dated July 31, 1984. Disclaimer filed May 13, 1985, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claim 1 of said patent.

4,511,443.—*Martin Goffman,* Edison, N.J., and *Thomas L. Jordan,* Amarillo, Tex. METHOD OF THIO-UREA ADDITION TO ELECTROLYTIC SOLUTIONS USEFUL FOR COPPER REFINING. Patent dated Apr. 16, 1985. Disclaimer filed May 13, 1985, by the assignee, *Asarco, Inc.*

The term of this patent subsequent to Oct. 2, 2001 has been disclaimed.

Disclaimers and Dedications

Des. 213,981.—*Roman F. Garbark,* Westchester, Ill. BUMPER FOR A PINBALL MACHINE. Patent dated Apr. 29, 1969. Disclaimer and Dedication filed Mar. 4, 1985, by the assignee, *Mylstar Electronics, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

Des. 238,435.—*Roman F. Garbark,* Westchester, Ill. ROLL-OVER GUIDE FOR PIN BALL MACHINE. Patent dated Jan. 13, 1976. Disclaimer and Dedication filed Mar. 4, 1985, by the assignee, *Mylstar Electronics, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

Des. 261,378.—*Timothy J. Bergeron,* Dolgeville, N.Y. CHILD'S CRAWLER. Patent dated Oct. 20, 1981. Disclaimer and Dedication filed May 13, 1985, by the assignee, *J. A. Preston Corp.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,390,255.—*Roman F. Garbark,* Westchester, Ill. STEPPING MECHANISM FOR USE IN A PINBALL MACHINE OR THE LIKE. Patent dated June 25, 1968. Disclaimer and Dedication filed Mar. 4, 1985, by the assignee, *Mylstar Electronics, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

3,627,318.—*Roman F. Garbark* and *Edward P. Krynski,* Chicago, Ill. FORCE DETECTING TARGET FOR PINBALL MACHINES AND THE LIKE. Patent dated Dec. 14, 1971. Disclaimer and Dedication filed Mar. 4, 1985, by the assignee, *Mylstar Electronics, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

3,675,927.—*Alvin J. Gottlieb* and *Wayne E. Neyens,* Elmhurst, *Robert T. Smith,* Berwyn and *Roman F. Garbark,* Westchester, Ill. TWO-PLAYER PINBALL MACHINE. Patent dated July 11, 1972. Dis-

claimer and Dedication filed Mar. 4, 1985, by the assignee, *Mylstar Electronics, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

3,739,311.—*Roman F. Garbark,* Northlake, Ill. BOBBIN ASSEMBLY FOR RELAY. Patent dated June 12, 1973. Disclaimer and Dedication filed Mar. 4, 1985, by the assignee, *Mylstar Electronics, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

3,793,510.—*Roman F. Garbark,* Westchester, Ill. ADD AND SUBTRACT RELAY. Patent dated Feb. 19, 1974. Disclaimer and Dedication filed Mar. 4, 1985, by the assignee, *Mylstar Electronics, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

3,901,511—*Roman F. Garbark,* Westchester, Ill. LIGHTED HOLE ASSEMBLY AND BALL PROJECTOR FOR PLAYBOARD. Patent dated Aug. 26, 1975. Disclaimer and Dedication filed Mar. 4, 1985, by the assignee, *Mylstar Electronics, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 25, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	3-25-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-04-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	5-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-23-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-03-83
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-83
MECHANICAL EXAMINING GROUPS	
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MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	7-08-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-14-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-01-83

Expiration of patents: The patents within the range of numbers indicated below expire during May 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,381,303 to 3,386,102, inclusive

Plant Patents ..... Numbers 2,811 to 2,813 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JULY 2, 1985

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T105,601
TUBESHEET IN A SEPARATORY DEVICE CURED USING RADIO WAVES

George B. Clark, 175 Mount Vernon Dr., Clayton, Calif. 94517

Continuation of Ser. No. 349,223, Feb. 15, 1982, abandoned, which is a continuation-in-part of Ser. No. 165,588, Jul. 3, 1980, abandoned. This application Aug. 3, 1983, Ser. No. 520,107

Int. Cl.³ B29F *3/08*

U.S. Cl. 264—25

No Drawing. 11 Pages Specification

The described invention is directed to a process for curing a tubesheet intended for use in a separatory device. In its broadest sense, the invention is the process for curing a thermoset resin tubesheet intended for a separatory device. This process comprises mixing with the uncured thermoset resin an electromagnetic susceptor which is capable of generating heat when exposed to radio frequency electromagnetic radiation. The thermoset resin containing the electromagnetic susceptor is applied to a segment of a bundle of hollow fibers so as to form a tubesheet when cured. The mixture formed is subjected to electromagnetic radiation for a time sufficient to cure the resin. The invention is further directed to a tubesheet in a separatory device containing a plurality of hollow fibers, said tubesheet comprising a cured thermoset resin containing an electromagnetic susceptor.

T105,602
THERMAL TREATMENT OF PHOSPHATE ROCK

Alexander D. Mair, Rte. 7, Box 143, Florence, Ala. 35630

Filed Sep. 10, 1984, Ser. No. 648,412

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—167

No Drawing. 17 Pages Specification

Phosphate rock is heated in two stages under controlled conditions to yield an improved calcined product rendered more suitable for subsequent acidulation by wet-process phosphoric acid. The two-stage thermal treatment of the instant invention is especially beneficial when applied to an apatitic phosphate rock possessing a high content of organic matter and a high degree of carbonate substitution in the apatite crystal lattice. By using heating conditions milder than those proposed by prior-art teachings, the instant process requires less externally supplied energy than such prior art calcination processes and yet yields calcined products of at least, and in most cases, greater than equivalent quality. For phosphate rock from the Pungo River Formation of North Carolina, a first-stage heating temperature in the range of 350° C. to 400° C. was particularly beneficial in providing acceptably low levels of both sulfide and residual organic matter and acceptably high levels of both surface area and reactivity to acid in the final calcined product.

T105,603
PROCESS FOR PRODUCING PHOSPHORIC ACID FROM LOW PURITY PHOSPHATE ROCK

George A. Kennedy, 2814 Alexander, and James R. Lehr, 124 Riverview Dr., both of Florence, Ala. 35630

Filed Sep. 27, 1984, Ser. No. 655,012

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—167

No Drawing. 25 Pages Specification

Adjustment of the maximum soluble sulfate level in phosphoric acid taken from, for example, an existing, conventional wet-process phosphoric acid production facility prior to reacting same with low purity phosphate rock at a temperature ranging from 45° C. to 65° C. and for a period of time ranging from about 10 minutes to 60 minutes effects selective dissolution of calcium and phosphate values from the rock without incurring high codissolution of aluminum and iron impurities. After separation from the undissolved impurity-containing gangue, the resulting solution of calcium phosphate in phosphoric acid is returned to the conventional wet-process facility for subsequent treatment with sulfuric acid to produce phosphoric acid and calcium sulfate, while the gangue is washed to recover additional phosphate values, and the wash liquor is transported to the conventional facility where it is used to wash the calcium sulfate filter cake.

T105,604
INTRACTABLE POLY(P-PHENYLENEBENZOBISTHIAZOLE) FIBER

William C. Uy, 9 Queens Ct., Wilmington, Del. 19808

Continuation of Ser. No. 412,168, Aug. 27, 1982, abandoned. This application May 21, 1984, Ser. No. 611,932

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—364

No Drawing. 12 Pages Specification

Poly(p-phenylenebenzobisthiazole) (PBT) fiber which is at least partially insoluble in methanesulfonic acid at room temperature. The fiber is prepared by heat treatment of PBT fiber, for a time sufficient to make it at least partially insoluble in methanesulfonic acid, at temperatures of 550° C. (e.g., for 600 seconds) to 780° C. (e.g., for 18 seconds).

T105,605
CYCLOTRIPHOSPHAZATRIENE-DERIVATIVES AS SOIL UREASE ACTIVITY INHIBITORS

Ramiro Medina, 105 Fountain St., Sheffield, Ala. 35660, and Jack M. Sullivan, 106 Patsy Dr., Florence, Ala. 35630

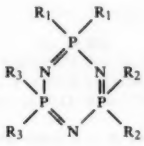
Filed Jun. 28, 1984, Ser. No. 625,424

Int. Cl.³ C12P *3/00*; C07F *9/22, 9/24*

U.S. Cl. 435—168

4 Sheets Drawing. 40 Pages Specification

Tests show that 2,2,4,4,6,6-hexaaminocyclotriphosphazatriene, 2-phenoxy-2,4,4,6,6-pentaaminocyclotriphosphazatriene, 2,4-diphenoxy-2,4,6,6-tetraaminocyclotriphosphazatriene and 2,4,6-triphenoxy-2,4,6-triaminocyclotriphosphazatriene (also frequently called phosphonitrilic derivatives) of the formula



are highly effective inhibitors of urease activity in agricultural soil systems wherein

(1) $R_1 \ldots R_3' = NH_2$ or

(2) $R_1' = R_2' = R_3' = R_2 = R_3 = NH_2$ and $R_1 = OC_6H_5$ or

(3) $R_1' = R_2' = R_3' = R_3 = NH_2$ and $R_1 = R_2 = OC_6H_5$ or

(4) $R_1' = R_2' = R_3' = NH_2$ and $R_1 = R_2 = R_3 = OC_6H_5$

The above-mentioned compounds and mixtures of the compounds show sustained inhibition of the soil urease activity for periods of at least 21 days.

REISSUES

JULY 2, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,930

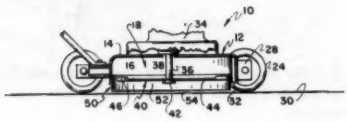
CONVERTIBLE ROTARY MOWER-VACUUM SWEEPER

Woodrow W. Luick, 104 Castlewood, Corpus Christi, Tex. 78410

Original No. 4,277,937, dated Jul. 14, 1981, Ser. No. 66,225, Aug. 13, 1979. Application for reissue Jul. 13, 1983, Ser. No. 513,463

Int. Cl.³ A01D *35/262*

U.S. Cl. 56—12.9 **12 Claims**



1. A rotary lawn mower/vacuum sweeper, comprising

a frame having an imperforate top panel and a depending peripheral wall providing a grass discharge passage therein and providing a grass cutting chamber having a downwardly facing opening defined by the wall;

at least three wheels on the frame for rollably supporting the frame on an underlying surface, the points of contact of the wheels and the underlying surface generally defining a plane;

a motor mounted on the top panel and including a drive shaft extending into the chamber;

[a grass cutting blade, in the chamber,] *only one grass cutting blade, the grass cutting blade residing in the chamber between the imperforate top panel and the bottom of the peripheral wall,* affixed adjacent the center thereof to the shaft and including a grass cutting edge rotated by the shaft in cutting relation to grass over which the frame moves, the blade being configured as a fan for forcing air through the discharge passage and for drawing air inwardly under the underside of the peripheral wall and residing above the bottom of the peripheral wall and

means for creating an area of substantial air velocity directed inwardly of the peripheral wall throughout substantially the length thereof, effective for lifting debris off the underlying surface in a generally annular band corresponding to the location of the peripheral wall, including

a skirt substantially the length of the peripheral wall, providing *an upper edge,* a lower edge and an imperforate portion above the lower edge and

means dependingly mounting the skirt on the frame in generally coaxial relation to the peripheral wall positioning the imperforate portion below the [lower edge] *underside of the peripheral wall* and spacing the lower edge from the plane but less than about ⅜" thereabove for drawing air inwardly into the chamber under the lower skirt edge upon operation of the motor;

the upper skirt edge being positioned above the underside of the peripheral wall throughout the extent of the skirt;

any obstruction of the chamber opening by the creating means providing an insignificant increase in air velocity under the lower skirt edge.

Re. 31,931

CHANNEL PROCESSOR

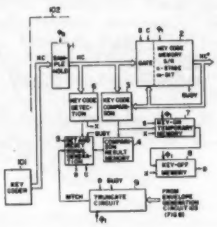
Norio Tomisawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Original No. 4,114,495, dated Sep. 19, 1978, Ser. No. 714,084, Aug. 13, 1976. Application for reissue Sep. 17, 1980, Ser. No. 188,006

Claims priority, application Japan, Aug. 20, 1975, 50-100878; Aug. 20, 1975, 50-100879; Aug. 20, 1975, 50-100880; Aug. 21, 1975, 50-101598

Int. Cl. G10H *1/02;* **G08C** *15/00*

U.S. Cl. 84—1.01 **21 Claims**



15. An electronic musical instrument comprising an overflow control circuit which is composed of a key code data assignor having means for generating time-divided key codes from a key code generator corresponding to a plurality of channels and generating an overflow signal when key codes more than empty channels are provided from the key code generator, an envelope generator controlled by the key code data assignor to provide envelope data of each of the plurality of channels, a comparison level memory for storing as comparison level data A the time-divided envelope data of a desired channel from the envelope generator, a comparator supplied with the time-divided envelope data in parallel with the comparison level memory to compare the next time-divided envelope data identified as comparison level data B with the comparison level A outputted from the comparison level memory, means for storing the comparison level data B in the comparison level memory when A>B, means for selecting and outputting in a time divisional manner a signal of a minimum level provided from the comparator at the end of one period of all channel detection, a minimum level channel detector for detecting a channel of the minimum level with the time-divided output and means for applying the output from the detector to the envelope generator with the arrival of the overflow signal from the key code data assignor to cause a highspeed release.

Re. 31,932

DIAPHRAGM ASSEMBLY FOR THE DEMAND REGULATOR OF A BREATHING APPARATUS

Raymond A. Christianson, P.O. Box 3700, Manhattan Beach, Calif. 90266

Original No. 4,147,176, dated Apr. 3, 1979, Ser. No. 591,710, Jun. 30, 1975. Continuation of Ser. No. 249,345, Mar. 31, 1981, abandoned. Application for reissue Oct. 7, 1982, Ser. No. 433,277

Int. Cl.³ A62B *7/04*

U.S. Cl. 128—204.26 **10 Claims**

11. In a scuba regulator second stage of the type having a housing and a flow control valve situated within said housing to control the flow of breathable gas from a source to a mouthpiece, said second stage also having a diaphragm situated within said housing and linked to said flow control valve to operate the same

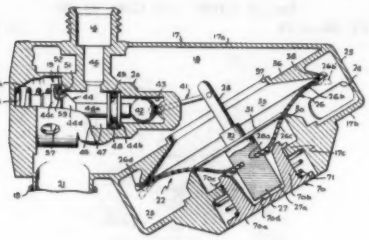
in response to sensed inhalation demand, the improvement wherein:

said housing includes a member separating the interior of said housing into two regions, a first region containing said flow control valve and a second region containing said diaphragm, said separating member having a central opening through which extends a link connecting said diaphragm to said flow control valve,

said housing having at least one exhaust opening extending from said second region to the exterior of said housing,

a generally annular flared member attached to said separating member about said central opening and extending into said second region,

said diaphragm being flexible and being in peripheral rim



contact with said annular flared member when said diaphragm is in the quiescent state, said annular flared member having an annular edge at its outermost extremity and said diaphragm having a bead at its outmost extremity, said bead of the diaphragm overhanging said annular edge at its periphery, inhalation causing movement of said diaphragm toward said first region to cause concomitant opening of said flow control valve, said diaphragm being sufficiently flexible so that upon exhalation at least a portion of the periphery of said diaphragm is displaced away from said rim contact with said annular flared member so as to provide an exhaust path for exhaled gases from said first region to said second region through the separation between said displaced diaphragm periphery and said annular flared member, and thence through said exhaust opening to the exterior of said housing.

Re. 31,933

HIGH TEMPERATURE WELL PACKER

Donald F. Taylor, Dallas, and James H. Bostock, Denton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Original No. 4,296,806, dated Oct. 27, 1981, Ser. No. 82,406, Oct. 5, 1979. Application for reissue Apr. 4, 1983, Ser. No. 482,323

Int. Cl.[3] **E21B** *33/128, 33/129;* **F16J** *15/12, 15/14*

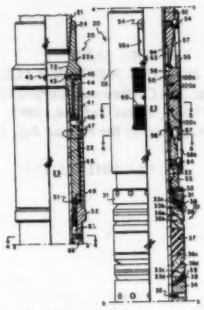
U.S. Cl. 166—120 **22 Claims**

11. In a packer for forming a seal with the inner wall of a casing string and having a sealing unit carried on a mandrel means, the sealing unit comprising:

a. a center element;

[a.] *b.* each end element having a partially elliptical cross section with parallel cylindrical inside and outside diameters;

[b.] *c.* the major axis of the partially elliptical cross sections forming an acute angle with the exterior of the mandrel means when the sealing unit is in its first position; and



[c.] *d.* the major axis moving towards a position normal to the mandrel means when the sealing unit is in its second position.

Re. 31,934

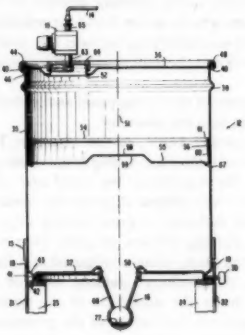
DISPOSABLE PUTTY DISPENSER

Lloyd E. Marston, Atlanta, Ga., assignor to Dynatron/Bondo Corporation, Atlanta, Ga.

Original No. 3,957,176, dated May 18, 1976, Ser. No. 297,252, Oct. 13, 1972. Continuation of Ser. No. 123,561, Mar. 12, 1971,. Application for reissue May 18, 1978, Ser. No. 907,278

Int. Cl.[3] **B67D** *5/54*

U.S. Cl. 222—181 **9 Claims**



9. A dispensing apparatus comprising a disposable cylindrical container including a curved side wall, a top wall and a bottom wall, a body of putty or the like filling said container from said bottom wall toward said top wall, an opening in said top wall for communication with a source of air pressure, a disposable follower inside said container normally resting on the top surface of the putty in the container, and an opening in said bottom wall for connection to a putty dispensing valve, said curved side wall including an annular rim extending about its upper portion, and said top wall including a plurality of spaced apart deformable lugs extending from its periphery and folded about the annular rim at the upper portion of said curved side wall *with a connection that permits one or more of said lugs to deform and allow a portion of said top wall to move away from said curved sidewall while the remaining lugs hold said top wall on said curved sidewall* , [whereby the lugs of the top wall are deformable] in response to excessive pressure in the container for forming an air release passage in said container above the level of the disposable follower and the putty and

said container in response to excessive pressure in said container.

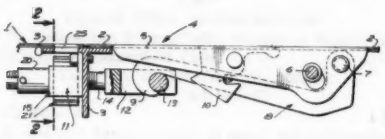
Re. 31,935
EXTERNALLY ACCESSIBLE ADJUSTER FOR FLUSH LATCHES

L. Richard Poe, Long Beach, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Original No. 4,183,564, dated Jan. 15, 1980, Ser. No. 882,173, Mar. 1, 1978. Application for reissue Oct. 6, 1980, Ser. No. 194,145

Int. Cl.[3] **E05C** *5/00, 19/12*

U.S. Cl. 292—113 **31 Claims**



6. An adjustable latching apparatus adapted for mounting on an aircraft or the like to secure a first aircraft member relative to a second aircraft member, comprising:

a latch assembly connected to said first aircraft member and an adjuster assembly connected to said second aircraft member;

said adjuster assembly including a tension adjustment wheel and a keeper;

said latch assembly including a latch arm engageable with said keeper and during engagement therewith operably connecting said keeper with said first aircraft member;

said tension adjustment wheel being adapted to receive said keeper and cause relative axial movement of said keeper with respect to said adjustment wheel and said aircraft members when said aircraft members are fixably positioned relative to one another and without axial movement of said tension adjustment wheel with respect to said aircraft members and thereby adjust the load substantially equally between said keeper and said latch arm and said aircraft members during axial movement of said keeper when said latch arm and said keeper are in engagement; and

frictional means restraining means being adapted to engage said tension adjustment wheel and thereby retard rotational movement thereof after adjustment of the load.

Re. 31,936
DISPERSING PAINT PIGMENTS

Peter R. Sperry, Doylestown, Pa.; Richard J. Wiersema, San Ramon, Calif., and Kayson Nyi, Sellersville, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Original No. 4,102,843, dated Jul. 25, 1978, Ser. No. 757,718, Jan. 7, 1977. Continuation of Ser. No. 6,132, Jan. 24, 1979,. Application for reissue Sep. 27, 1983, Ser. No. 536,821

Int. Cl.[3] **C08L** *31/00*

U.S. Cl. 524—522 **47 Claims**

30. An improved aqueous emulsion paint comprising a mixture of film-forming latex polymer and a pigment dispersion, containing as dispersant, from about 0.01 to about 5%, based on pigment weight, of a water-soluble alkali metal, ammonium, or amine salt of a copolymer having a number average molecular weight in the range of about 500 to about 5,000 consisting essentially of polymerized units of (A) 29 to 75 weight percent of a hydroxyalkyl ester of acrylic acid or methacrylic acid, wherein the alkyl group of the ester moiety has from two to six carbon atoms; and (B) 25 to 70 weight percent of acrylic acid, methacrylic acid, itaconic acid, or the half ester or half amide of itaconic acid.

Re. 31,937
SEMICONDUCTOR DEVICE AND METHOD FOR ITS PREPARATION

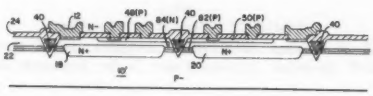
Yoshinobu Momma, Sagamihara; Yunosuke Kawabe, Yokohama, and Osamu Hataishi, Kawasaki, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Original No. 4,231,057, dated Oct. 28, 1980, Ser. No. 960,228, Nov. 13, 1978. Application for reissue Mar. 4, 1981, Ser. No. 240,498

Claims priority, application Japan, Nov. 29, 1977, 52-143190

Int. Cl.[3] **H01L** *27/04*

U.S. Cl. 357—50 **10 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having a first conductivity type;

a plurality of buried layers of a second conductivity type opposite to said first type formed in selected portions of the surface of said semiconductor substrate an epitaxial layer of said second conductivity type formed over said semiconductor substrate and said layers;

a plurality of isolation regions formed between adjacent ones of said buried layers, said isolation regions extending downward from the surface of said epitaxial layer to said semiconductor substrate;

an epitaxial layer of said second conductivity type formed over said semiconductor substrate and said buried layers;

a plurality of first regions having said first conductivity type formed in said epitaxial layer corresponding to said buried layers, each said first region extending to respectively contact said isolation regions; and

a plurality of second regions having said second conductivity type formed between said semiconductor substrate and said epitaxial layer, and between said isolation regions and said buried layers, said second conductivity type regions having higher conductivity than that of said epitaxial layer and have a depth shallower than the deepest portion of the buried layers.

PLANT PATENTS

GRANTED JULY 2, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,503
PEACH TREE, "SUPECHFOUR"

John H. Weinberger, Fresno, Calif., assignor to Superior Farming Company, Bakersfield, Calif.

Filed Nov. 25, 1983, Ser. No. 555,017
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, and which is characterized by its regular and productive bearing of large, yellow-fleshed and delicately-flavored fruit; and by its general resemblance to the Flavorcrest Peach Tree (unpatented), but from which it is distinguished by its fruit ripening about three days earlier and having a more highly red colored skin, and having a smoother exterior surface in that the ventral suture is seldom raised appreciably.

5,504
CARNATION NAMED STANDISC

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij, M. C. van Staaveren, Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,262
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct carnation cultivar, substantially as herein shown and described, characterized by its continuous production of generally pink flowers somewhat variegated with white and occasional dark red longitudinal stripes.

5,505
CARNATION NAMED MULOPI

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij, M. V. van Staaveren, Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,457
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct miniature carnation cultivar, substantially as herein shown and described, characterized by its fast and excellent production of blooms with a larger than normal number of flowers on each flowering stem.

5,506
CARNATION NAMED MUDAVE

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij, M. C. van Staaveren, Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,459
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct miniature carnation plant, substantially as herein shown and described, characterized by its fast and profuse production of small white flowers which are borne in greater number on each flowering stem than is normal for common miniature varieties.

5,507
CARNATION NAMED STANBRODA

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij, M. C. van Staaveren, Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,681
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—73 **1 Claim**

1. The new and distinct variety of carnation plant, substantially as herein shown and described, characterized by its continuous year round production of relatively large blossoms, and the stability of the flower color which holds through all seasons.

PATENTS

GRANTED JUL. 2, 1985

ERRATA

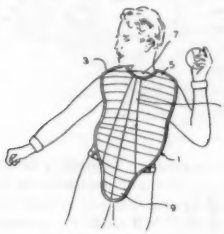
For CLASS	See PATENT NO.
066–001	4,526,026
556–043	4,526,724
556–056	4,526,725
514–025	4,526,784
428–209	4,526,785
514–240	4,526,786
514–255	4,526,787
514–374	4,526,788
514–627	4,526,789
429–191	4,526,855
524–724	4,526,937
524–496	4,526,952
514–549	4,526,999
358–019	4,527,145
381–051	4,527,274
381–071	4,527,282
382–009	4,527,283

PATENTS

GRANTED JULY 2, 1985

GENERAL AND MECHANICAL

4,525,875
CHEST PROTECTOR WITH RIGID PLATES
Walter F. Tomczak, Fond du Lac, Wis., assignor to MacGregor Sporting Goods, Inc., East Rutherford, N.J.
Filed Jul. 15, 1983, Ser. No. 514,324
Int. Cl.[3] A41D *13/00*
U.S. Cl. 2—2 **9 Claims**

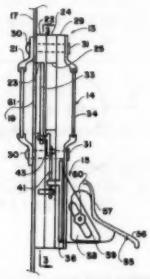


1. An improved chest protector having a flexible pad of shock-absorbing material for protecting the torso of a wearer, said pad defining a plurality of distinct cushions,

wherein the improvement comprises:

means for providing increased protection to the sternum area of the wearer, said protection means including at least one sternum plate attached to at least two cushions of said flexible pad on the side opposite the wearer's body and directly over the wearer's sternum.

4,525,876
WELDER'S HELMET
Bernard A. Bailey, Box 306, Deer Lodge, Mont. 59722
Continuation-in-part of Ser. No. 202,646, Oct. 31, 1980, abandoned. This application Nov. 19, 1982, Ser. No. 442,894
Int. Cl.[3] A61F *9/06*
U.S. Cl. 2—8 **12 Claims**



1. A welder's helmet including a helmet portion, a filter support portion, a filter portion and a filter actuating portion; said helmet portion including a shield section, a head band section connected to said shield section, a viewing opening in said shield section; said filter support portion being mounted adjacent to said viewing opening, said filter support portion including a first frame section, said first frame section being disposed over the outside of said viewing opening, a second frame section disposed over the inside of said viewing opening, said second frame section including an opening therein adjacent said shield viewing opening, a third frame section disposed adjacent to said second frame section, said third frame section including an opening adjacent said helmet viewing opening, said third frame section including an elongated vertically oriented slot therethrough below said third frame section opening, said filter portion including a filter member slidably positioned between said second and third frame sections, said filter member being movable from a position between said second and third frame section openings to a position below same; said filter actuating portion including an actuator plate section disposed over said third frame section and movable with respect thereto, guide means for said actuator plate section, said actuator plate section being movable linearly in a plane substantially parallel to said third frame section, a stud member extending from one side of said actuator plate section, said stud member being positioned to extend through said elongated opening in said third frame section, an actuator arm member disposed between said second and thrd frame sections, said actuator arm member being pivotally connected to one of said second or third frame sections, said pivotal connection being adjacent one end of said arm member, a link member operatively connecting said filter member with said actuator arm member at a point remote from said pivotally connected end thereof, said stud member of said actuator plate section extending through an opening in said actuator arm member disposed along the length thereof, biasing means urging said filter member into a position over said viewing opening of said shield section, said biasing means including a spring strip operatively connected between said actuator plate section and one of said frame sections, a chin-contacting member affixed to said actuator plate section, said chin-contacting member including a substantially horizontal section and a substantially vertical section; whereby when said helmet is positioned on a person's head, movement of the person's chin while in contact with said chin-contacting member will cause said filter member to move downwardly from said viewing opening.

4,525,877
SPORTS GLOVE
Hae C. Chong, Seoul, Rep. of Korea, assignor to Franklin Sports Industries, Inc., Stoughton, Mass.
Filed Nov. 16, 1983, Ser. No. 552,253
Int. Cl.[3] A41D *19/00*
U.S. Cl. 2—161 A **8 Claims**

1. A sports glove for use in a game which requires a player to securely grip some type of racquet or club handle, said glove having four finger portions and a thumb portion comprising

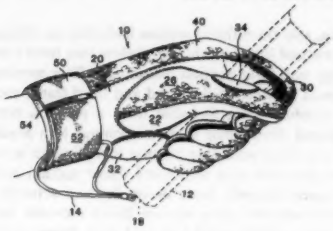
a handle-gripping front portion covering the fingers and palm of the player comprised of one continuous piece of substantially inextensible material, said handle-gripping surface extending from the front of the player's fingertips to the bottom of the player's palm;

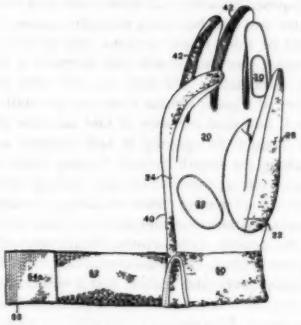
a back portion which extends from the back of the tip of player's fingertips to the base of the player's wrist, said back portion being comprised of a terry cloth material for absorbing perspiration;

a wrist portion which extends over the wrist of the player and which is integral with the back portion, said wrist portion extending entirely around the player's wrist and connecting to said front portion of the glove, said wrist portion also being comprised of a terry cloth material for absorbing perspiration;

a wrist support band which extends completely over said wrist portion and having a first end being attached to said wrist portion of the glove, said wrist support band being

of an elastically extensible material and having a first fastener element secured to one side of the first end





thereof and a mating fastener element secured on an opposite side of a second end of said wrist support band.

4,525,878

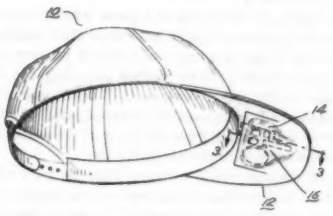
MUSICAL HAT, CAP OR SIMILAR HEAD COVERING

Henry E. Lowe, Jr., 201 N. Edwards St., Cassopolis, Mich. 49031

Filed Jun. 11, 1984, Ser. No. 619,294

Int. Cl.[3] **A63H** *33/26*

U.S. Cl. 2—185 R **6 Claims**



1. A musical hat comprising:

a. head covering means adapted for wearing on the head of a person and having a visor means projecting outwardly therefrom, said visor means having upper and lower layers and a compartment between said layers;

b. an electrical musical device disposed in said compartment; and

c. a switch means in said compartment connected to said device and engageable by one of said layers when said visor is grasped by the wearer for activating said device.

4,525,879

BELTS WITH CONCEALED POCKETS

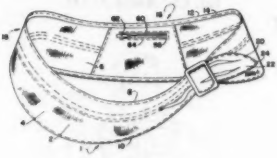
Mary Kalomeris, 303 W. 66th St., New York, N.Y. 10023

Continuation-in-part of Ser. No. 373,192, Apr. 29, 1982, abandoned. This application Dec. 12, 1983, Ser. No. 560,408

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.[3] **A41F** *19/00*

U.S. Cl. 2—338 **20 Claims**



1. Belt apparatus comprising a decorative facial shell of soft pliable material having outer and inner surfaces, having upper and lower edges and having first and second opposite ends, thereby forming a general belt shape for promoting desired drape of the belt when worn, a pocket having upper and lower edges of the belt and having opposite first and second lateral edges extending between the upper and lower edges, the pocket being secured to the inner face of the shell along opposite lateral edges, the pocket having an elongated opening therein spaced slightly downward from the upper edge thereof, means positioned along the opening for selectively closing and opening the opening, the upper and lower edges of the pocket and means for securing the inward rolled position of the edges of the belt and means for securing upper and lower edges of the pocket within the inward rolled upper and lower edges of the belt.

4,525,880

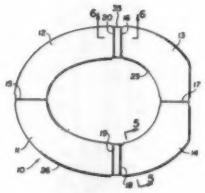
PORTABLE AUXILIARY TOILET SEAT

Joseph Bass, 1400 St. Charles Pl., Pembroke Pines, Fla. 33026

Filed Aug. 8, 1983, Ser. No. 521,177

Int. Cl.[3] **A47K** *13/14*

U.S. Cl. 4—244 **11 Claims**



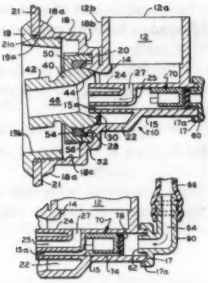
1. A portable toilet seat adapted to fit over a permanent toilet seat comprising, a shell made from a thin semirigid material having a substantially oval shape with a substantially oval opening therethrough, said shell having inner and outer edges extending curvingly downward from the top surface thereof such that said portable toilet seat substantially conforms to the top surface of said permanent toilet seat when fitted thereon, one or more thin disposable liners having a substantialy oval shape fitted within said shell, said one or more liners being removable from said shell following use thereof, and a least four hinges connected to said shell with each hinge being spaced apart from each adjacent hinge by approximately ninety degrees whereby said sheel is foldable into a first half oval shape with the inner surfaces of each half oval being in contact with each other and is foldable into a second one-quar-

ter oval shape with the outer surfaces of each quarter oval being in contact with each other.

4,525,881
HYDROTHERAPY SYSTEM FOR TUBS, SPAS OR POOLS

John A. Higginbotham, Maple Grove, Minn., assignor to Jope Manufacturing Co. Inc., Minneapolis, Minn.

Filed Feb. 15, 1984, Ser. No. 580,379
Int. Cl.[3] A04H *3/18*; A61H *33/02*; E03C *1/02*
U.S. Cl. 4—496 **7 Claims**

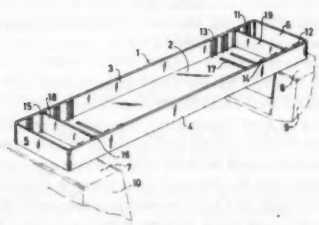


1. A hydrotherapy jet comprising a housing,
a movable nozzle having a passage therethrough with a fluid inlet and a fluid outlet at opposite ends of the passage,
the movable nozzle being supported in the housing for movement about a center point to enable the outlet to be pointed in different directions,
means at the inlet end of the nozzle defining a water stream flowing toward the passage in the nozzle,
means at the inlet end of the nozzle defining an air outlet port,
an air inlet passage,
a valve chamber communicating between the air inlet passage and the air outlet port,
an air and water check valve in the valve chamber adapted to move therein between a seated sealing position preventing the escape of water therethrough from the nozzle and an open position allowing the passage of air into the chamber from the air inlet passage and out through the outlet port in the nozzle.

4,525,882
BATH-TUB TRAY

Inga E. Stenberg, Erik Dahlbergsgatan 27, S-115 32 Stockholm, Sweden

Filed Oct. 22, 1984, Ser. No. 663,486
Claims priority, application Sweden, Nov. 18, 1983, 8306371
Int. Cl.[3] A47K *3/00*
U.S. Cl. 4—559 **3 Claims**

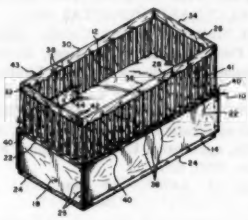


1. bath-tub tray (1) intended to be placed across a bath-tub and to support soap, brushes and like articles, the length of said tray being such that the ends thereof extend over the longitudinally extending, substantially horizontal edge surfaces (7,8) of the bath-tub, characterized in that the mutually opposing, longitudinally extending walls (3,4) of the tray are provided at at least one end portion of said tray with mutually opposing pairs of grooves (11,2; 13,14; 15,16) which extend towards the bottom of the tray; in that the tray bottom (2) is provided with slots (17) which extend between respective groove pairs and which are shorter than the distance between the two grooves in each groove pair; in that there is provided at least one resilient plate (18,19) comprising an upper broad portion (20) and a lower narrower portion (21), said broad plate portion (20) being intended to be inserted into and firmly held between the grooves of the one groove pair, and the narrower portion (21) being intended to be inserted down through the co-acting slot (17) and to lie resiliently against one inner wall of the bath-tub in a clamping fashion; and in that provided at the other end of the tray is a resilient clamping means which projects out from the bottom of the tray and which is arranged to lie against the other inner wall of the bath-tub.

4,525,883
CONVERTIBLE BED

Loretta A. Necowitz, 823 Kingston Dr., Cherry Hill, N.J. 08034

Filed Apr. 30, 1984, Ser. No. 605,412
Int. Cl.[3] A47D *7/00*
U.S. Cl. 5—93 B **16 Claims**



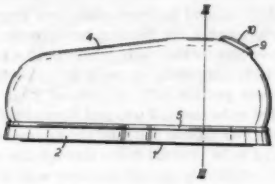
1. A bed to hold a full size mattress capable of conversion to and from a child's crib comprising:
(a) a frame to hold the full size mattress at a height such that the upper edge of the mattress is proximate to the upper edge of the frame, comprising two side members, a head member and a foot member,
(b) a holding means structurally attached to the inside of each frame member to provide a plurality of vertical passageways capable of receiving and holding vertical bars in an upright position, and
(c) a guard rail means to prevent a young child from falling off the bed or climbing out of the bed, comprising a plurality of sections, each section to rest proximate to the top edge of the frame members and each section comprising an upper horizontal rail, a lower horizontal rail, and a plurality of vertical bar members staggered horizontally, extending between the upper and lower rails, and structurally attached at their ends to the rails to form a horizontal ladder shape,
wherein a plurality of the vertical bar members extend downwardly past the lower horizontal rail into the open passageways of the holding means, and
wherein at least one of the guard rail sections comprises a separable gate length of the guard rail section detachably connected at abutting edges to adjacent upper horizontal rails and having at least two extended vertical bar members extending into the holding means.

4,525,884

SUN BEDS

Derek C. Tolley, Eisteddfa Farm, Llannon, Llanelli, Dyfed, Wales

Filed Aug. 2, 1982, Ser. No. 404,566
Int. Cl.³ A47C *27/08, 29/00*
U.S. Cl. 5—423 **8 Claims**



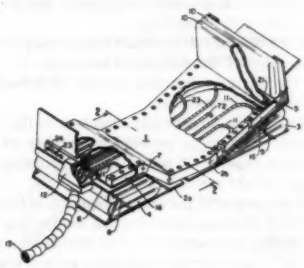
1. A sun bed comprising a clear plastic dome with venting means adjustable from the interior in the region of its highest point, and a generally flat base with an upstanding rim on which the dome seats when closed over the base, the rim being of inverted U-section with an outer flange that is clear of the ground and a top portion, from which that flange depends, provided with vents, the dome seats being around the outer periphery of that top portion, solar action generating convection currents which will draw air in through the vents and out through the venting means.

4,525,885

SUPPORT APPLIANCE FOR MOUNTING ON A STANDARD HOSPITAL BED

William V. Hunt, Matravers; John A. Coletta; Richard J. Howling, both of Poole, and Leonard Higgs, Bovington, all of England, assignors to Mediscus Products Limited, Wareham, England

Continuation of Ser. No. 238,526, Feb. 26, 1981, Pat. No. 4,488,322. This application Nov. 16, 1984, Ser. No. 672,596
Claims priority, application United Kingdom, Feb. 26, 1980, 8006375; Feb. 26, 1980, 8006724
Int. Cl.³ A47C *27/10*; A61G *7/04*
U.S. Cl. 5—453 **3 Claims**



1. A support appliance for mounting on a standard hospital bed comprising:

(a) a separate, self-contained base structure adapted to be fitted onto a standard hospital bed;

(b) a plurality of elongated inflatable air sacs for supporting a patient arranged in groups longitudinally relative to said bed frame, said groups each corresponding to different portions of the body of a patient lying on said appliance, each said sac having a surface for supporting the patient at least a portion of which surface comprises a microporous fabric which is permeable to water vapor but not to liquid;

(c) said base structure comprising at least three hinged base boards approximately corresponding respectively to the upper body, seat and leg portions of the patient;

(d) elongated air supply header chambers supported by said base boards, each header of which is respectively adapted to supply compressed air to each said group of sacs, each said header having discreet openings in its upper surface aligned and spaced therealong;

(e) separate flexible header air supplying conduits one for each of said headers and respectively connected thereto;

(f) releasable means for connecting each sac to a corresponding header chamber at a respective discreet opening thereof and for aligning said sacs transversely of and contiguously from end-to-end of said base structure;

(g) an air supply conduit housing connected along one edge of said base structure;

(h) a plurality of flexible exterior conduits leading to said housing each corresponding to a separate one of said header air supplying conduits;

(i) said header air supplying conduits leading from said headers to said housing at the edge of said base structure; and

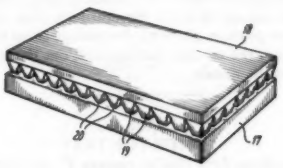
(j) releasable means associated with said housing for interconnecting said respective header supply and exterior conduits.

4,525,886

BODY SUPPORT ADAPTED TO DIFFERING VOLUME TO WEIGHT RATIOS

Franciscus G. Savenije, Schalkhaar, Netherlands, assignor to Auping B. V., Netherlands

Filed Feb. 3, 1983, Ser. No. 463,478
Claims priority, application Netherlands, Feb. 3, 1982, 8200401
Int. Cl.³ A47C *23/06, 27/08, 31/12*
U.S. Cl. 5—464 **16 Claims**



1. A body support device having a primary axis parallel to the direction of a centerline of a human body which the support device is adapted to support comprising:

at least one flexible container adapted to be filled with a fluid medium, said at least one flexible container lying coextensive with at least a portion of the device and arranged parallel to the primary axis;

a flexible mattress having longitudinal edges, said mattress positioned above said flexible container; and

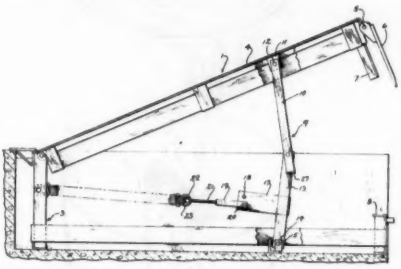
a plurality of load transmitting elements having lower surfaces of varying shapes, said plurality of load transmitting elements arranged between said mattress and said flexible container, said flexible container being in contact with at least two adjacent load transmitting elements, the shapes of the lower surfaces varying from each other in accordance with the volume to weight ratios of the several parts of the human body which the device is adapted to support.

4,525,887

COUNTERBALANCING MECHANISM FOR THE RAMP OF A DOCKBOARD

Kjell I. Erlandsson, Milwaukee, and William B. Weishar, Brookfield, both of Wis., assignors to Kelley Company, Inc., Milwaukee, Wis.

Filed Jul. 5, 1983, Ser. No. 510,689
Int. Cl.³ E01D *1/00*
U.S. Cl. 14—71.3 **5 Claims**



1. In a dockboard having a frame and a ramp pivotally connected at its rear edge to the frame and movable between a downwardly inclined position and an upwardly inclined position, a counterbalancing mechanism for counterbalancing the weight of the ramp, comprising a first link pivotally connected to the ramp at a first pivot, a second link pivotally connected to the frame at a second pivot, said links being pivotally connected together at a third pivot, said links being in the acute angle relationship when the ramp is in the downwardly inclined position, said counterbalancing mechanism including an extension spring having a first end connected to the frame and a second end connected to said second link at a fourth pivot, said second, third and fourth pivots being disposed in triangular relationship, said fourth pivot being at a level above said second and third pivots and said fourth pivot being located forwardly of said second pivot when the ramp is in the downwardly inclined position, the force of said extension spring acting to move the links toward an in-line position and pivot the ramp from the downwardly inclined position to the upwardly inclined position, said fourth pivot being located to the rear of said second pivot when the ramp is in the upwardly inclined position.

4,525,888

MAINTAINING CONSTANT PICK-UP BROOM PATTERN

Douglas A. Bargiel, Grand Terrace; Edward M. Assony, Westminster; Truong M. Ha, Riverside, and Richard B. Rosseau, Clairmont, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 9, 1983, Ser. No. 530,832
Int. Cl.³ E01H *1/04*
U.S. Cl. 15—83 **8 Claims**

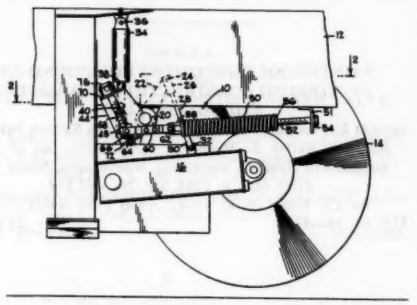
1. An apparatus for maintaining a substantially constant broom pattern on a surface being swept throughout the useful life of a power driven broom journaled on arms movably mounted on the chassis of a mobile sweeper for accommodating vertical movement of said broom, the improvement which comprises:

means defining a shaft having a longitudinal axis journaled on said chassis,

linkage means pivotally connecting said shaft to said arms,

lever means rigidly secured to said shaft and projecting outwardly from said axis in a first direction, and

means defining a spring loaded overcenter linkage having one end pivotally connected to said chassis at a location projecting outwardly from said axis in a second direction



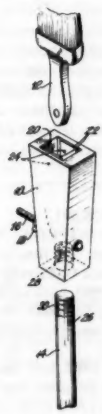
and another end pivotally connected to said lever means for applying a progressively decreasing lifting force to the broom as the broom weight decreases due to wear to a point at which the weight of the broom establishes the desired broom path, continued reduction of the weight of the broom due to wear, progressively applying an increasing downward force on the broom until the broom is worn sufficiently to terminate its useful life.

4,525,889

PAINT BRUSH HOLDER

Mark J. Dunau, P.O. Box 413, Wolfeboro, N.H. 03894

Filed May 16, 1984, Ser. No. 610,778
Int. Cl.³ B05C *17/00;* **A46B** *17/02*
U.S. Cl. 15—146 **2 Claims**



1. A paint brush holder for use with a brush, said holder comprising a block having a central rectangular opening at its

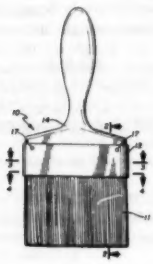
upper end, a spring clip having opposing faces secured to the wider interior walls of said rectangular opening and adapted to removable but securely engage and hold opposite faces of the handle of the brush within said opening, a pole, said block having an internally threaded socket formed in its lower end and operative to mate with an externally threaded end on said pole, whereby the brush may be held vertically relative to said pole, said block further including means for pivotally attaching said pole to a side of said block, whereby the brush may be selectively angled relative to said pole.

4,525,890

PAINTBRUSH EMBEDMENT COMPOUND AND PAINTBRUSH CONSTRUCTION AND METHOD EMBODYING SAME

Dwight E. Peerman, Minnetonka; H. Gorden Kanten, Minneapolis, and Kelvin K. Bonnema, Moundsview, all of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Mar. 4, 1983, Ser. No. 472,179
Int. Cl.[3] **C08G** *18/48, 18/42;* **A46B** *1/00;* **A46D** *1/00*
U.S. Cl. 15—193 **22 Claims**



1. An embedment compound for a paintbrush or the like of the type which includes a plurality of bristles, a handle portion and an intermediate portion disposed between said bristles and said handle portion, said embedment compound functioning to bond said bristles to one another and to said intermediate portion and comprising: a highly crosslinked polyurethane composition wherein said polyurethane composition has a calculated crosslink density of at least 15 crosslinks per 10,000 cubic centimeters of cured polyurethane composition.

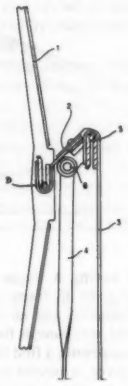
4,525,891

WINDSCREEN WIPER SYSTEM

Andre R. Leroy, 64 Chaussee de Binche, Mons-Saint-Symphorien, 7030, and Jean-Marie G. Flamme, 22 rue de la Delivrance, Beloil-Stambruges, 7980, both of Belgium

PCT No. PCT/FR82/00154, § 371 Date May 23, 1983, § 102(e) Date May 23, 1983, PCT Pub. No. WO83/01043, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 22, 1982, Ser. No. 504,036
Claims priority, application Belgium, Sep. 23, 1981, 5/5235
Int. Cl.[3] **B60S** *1/34, 1/40, 1/44*
U.S. Cl. 15—250.23 **9 Claims**

1. Windscreen wiper system for a vehicle, for providing a non-circular wiping path for at least one windscreen wiper blade, comprising a main guide arm, a rocker, means pivotally connecting said rocker to the main guide arm at a first pivot connection for pivotal movement about an axis generally parallel to the windscreen, means pivotally connecting the rocker to a wiper blade at a second pivot connection spaced from and parallel to the first pivot connection, means for connecting the main guide arm to a drive shaft remote from said rocker for oscillating the arm about an oscillation axis to move the wiper blade back and forth across the windscreen, and means for pivoting said rocker about said first pivot connection on said



main guide arm, during oscillation of said main guide arm, to displace said second pivot connection and the wiper blade relative to said oscillation axis, said means comprising, a secondary guide arm pivotally connected to said rocker at a location spaced from said first pivot connection, and pivot means for pivotally connecting an end of the secondary guide arm remote from the rocker for pivotal movement about a third pivot connection spaced from said oscillation axis of the main guide arm.

4,525,892

PAIL COVER HAVING MOPWRINGER

John Vayas, 11 Midland Pl., Newark, N.J. 07106; Konstantinos Zembilis, and Lemonia Zembilis, both of 6 Winthrop Pl., Maplewood, N.J. 07040

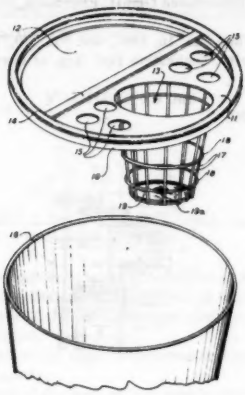
Filed Dec. 6, 1982, Ser. No. 446,958
Int. Cl.[3] **A47L** *13/142*
U.S. Cl. 15—263 **15 Claims**

1. A removable cover for a pail having means for wringing a mop, comprising:

a panel sized to cover said pail and having an encircling lip, said lip having an underside shaped to detachably engage said pail on its top, said panel having an opening sized to pass said mop and spaced from and alongside said lip, said opening having an edge defining a circular arc, said panel being formed of a plastic material;

a basket wringer depending in a direction internally and substantially perpendicular from said panel, said panel having an aperture over said wringer to allow access thereto by said mop, said panel having a plurality of drainage holes disposed about said wringer and positioned away from the center of said panel where the greatest stress exists; and

a reinforcing rib affixed to said panel between said basket wringer and said opening, said rib being sized to restrict the flexing of said plastic material of said panel, said rib having a first section depending from said panel in the



same direction as said wringer and a second section depending from said panel in an opposite direction; and

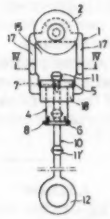
said drainage holes and said second rib section being cooperatively arranged to avoid puddling of liquid on said panel.

4,525,893

CURTAIN RUNNER

Hiroo Fukada, Tokyo, Japan, assignor to Toso Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1983, Ser. No. 532,569
Claims priority, application Japan, Sep. 16, 1982, 57-138927
Int. Cl.³ A47H *15/00*
U.S. Cl. 16—102 **4 Claims**



1. A curtain runner comprising a body consisting of a top wall, side walls, and a bottom wall which define a chamber, said top wall being provided with roller means, and said bottom wall being formed with a vertical bore,

a sleeve fitted in said vertical bore and formed with a center hole, said sleeve having top and bottom flanges which are larger than said vertical bore, and

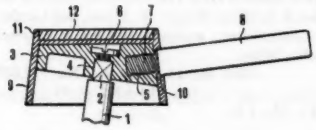
a rod fitted in said center hole in said sleeve and formed with at least one knob at the top end thereof and a curtain-joint at the bottom end thereof, said chamber being larger than said sleeve and having a width of an upper portion thereof larger than a lower portion thereof and where the width of the lower portion is slightly larger than the diameter of said top flange, said center hole having the top portion thereof smaller than said knob and the other portion larger than said knob, and the upper and lower walls of said sleeve being provided with a plurality of radial splits which expand said top portion of said center hole wider than said knob and contract said bottom flange smaller than said vertical bore, whereby the sleeve is mounted through the chamber by causing the bottom flange with the radial splits to compress and pass through the vertical bore, and the rod is coupled with said sleeve by inserting it from the bottom into the center hole of the sleeve causing the top knob to expand the radial splits of the top flange.

4,525,894

HANDLE FOR A SINGLE-CONTROL MIXER VALVE AND THE LIKE

Alfons Knapp, Biberach an der Riss, Fed. Rep. of Germany, assignor to Masco Corporation, Taylor, Mich.

Filed Apr. 4, 1983, Ser. No. 481,663
Claims priority, application Italy, Apr. 26, 1982, 67547 A/82
Int. Cl.³ B25G *1/10*
U.S. Cl. 16—111 R **10 Claims**



1. A single-control mixer valve handle having an inner actuating lever and an outer control lever and a connecting device; said connecting device characterized by:

a connection member provided with coupling means for rigidly connecting it to the inner actuating lever and with a threaded bore for mounting the outer control lever;

a cap insertable onto said connection member and provided with a bore corresponding to said threaded bore of the connection member; and

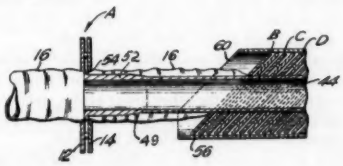
a fastening screw for fixing the outer control lever, screwable into said threaded bor of the connection member and passing through said bore of the cap, whereby the fastening screw which fixes the outer control lever also fixes the cap to the connection member.

4,525,895

ARTICLE FOR USE IN AUTOMATICALLY AND CONTINUOUSLY MAKING STUFFED CASING PRODUCTS

Vytas A. Raudys, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 9, 1982, Ser. No. 448,349
Int. Cl.³ A22C *11/00*
U.S. Cl. 17—1 R **29 Claims**



1. A magazine for use in making stuffed casing products, said magazine comprising:

(a) an elongated tubular mandrel having a fore end and an aft end;

(b) a longitudinally extending outer support member disposed about at least a portion of said mandrel so the fore end of said mandrel extends out from a fore end of said support member, said outer support member being of a configuration sufficient to fit within a casing to be stuffed; and

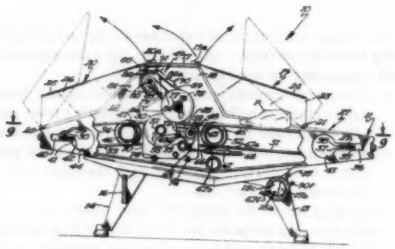
(c) said mandrel and outer support member defining a space therebetween which is open towards the fore end of said mandrel, said space being adapted to nest a plurality of generally flat annular discs received and stacked on said mandrel for movement along said mandrel in a direction out of said space and towards said fore end.

4,525,896

PORK SHOULDER OR HAM SLASHER APPARATUS

Lyndon R. Leining; Rodger W. Bliese, and Gordon G. White, all of Austin, Minn., assignors to Geo. A. Hormel & Company, Austin, Minn.

Filed Jul. 11, 1983, Ser. No. 512,889
Int. Cl.³ A22C *9/00*
U.S. Cl. 17—1 R **18 Claims**



1. Apparatus for slashing cuts of meat containing bones, such as hams, shoulders and the like, prior to the removal of the bones from the cuts, comprising:

a frame having an inlet and an outlet;

conveyor means on said frame for supporting and moving cuts of meat from said inlet to said outlet, said conveyor means including a plurality of horizontally disposed endless conveyor elements arranged in side-by-side relation and defining a continuous horizontal support surface, the cuts of meat being horizontally supported on and moved by a plurality of the conveyor elements when moved from the inlet to the outlet;

a plurality of similar revolvable upper blades, means mounting each upper blade on the frame for vertical movement independently of the other upper blades;

a plurality of similar revolvable lower blades, means mounting each lower blade on the frame for vertical movement independently of the other lower blades, each lower blade having an edge portion projecting between a pair of upper blades in overlapping relation therewith;

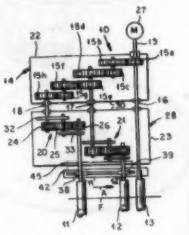
power means, means for drivingly connecting said upper and lower blades with said power means for revolving said blades whereby when a cut of meat is moved by the conveyors from the inlet to the outlet of the frame, the cut of meat will be simultaneously slashed through its upper and lower surfaces by said blades.

4,525,897

FILAMENT DRAWING FRAME WITH VARIABLE ROLLER-PAIR SPACING

Günter Schulz, Ebersbach, and Jakob Bothner, Göppingen-Jebenhausen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Jan. 16, 1984, Ser. No. 570,777
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 3301239
Int. Cl.³ D01H *5/74*
U.S. Cl. 19—260 **12 Claims**



12. In a filament drawing apparatus comprising:

a support;

at least two pairs of rollers spaced apart on the support in a travel direction, whereby filaments to be drawn pass in the direction between the rollers of both pairs;

a drive having at least two output shafts and including transmission means for rotating the shafts at different speeds, one of the shafts being connected to one of the roller pairs, the other roller pair being displaceable on the support in the direction relative to the one roller pair;

an input gear mounted on the other output shaft;

an output gear mounted on one of the rollers of the other roller pair and diplaceable therewith in the direction; and

an intermediate gear meshing with and interconnecting the input and output gears, whereby rotation of the other output shaft is transmitted from the input gear through the intermediate gear and output gear to the one roller of the other roller pair; the improvement comprising:

an input link having one end pivoted at the other output shaft and an opposite end; and

an output link having one end pivoted at the one roller of the other roller pair and having an opposite end pivoted on the opposite end of the input link, the intermediate gear being mounted and rotatable on the opposite ends of the links.

4,525,898

INVERTED TEE CROSS SECTION CLIP

James A. Gallion, Cary, and Roman M. Tomczak, Raleigh, both of N.C., assignors to Tipper Tie, Inc., Apex, N.C.

Filed Aug. 11, 1983, Ser. No. 522,111
Int. Cl.³ B65D *77/18*
U.S. Cl. 24—30.5 W **1 Claim**

1. An improved, integral U-shaped clip of uniform cross section for attachment as a closure, said clip including opposed

legs connected by a crown, comprising a generally inverted T-shaped cross section including a T-head and a T-leg, said T-head being positioned on the inside of said crown and said opposed legs so as to define a closure surface, said T-leg extending outwardly and away from said closure surface, said T-shaped cross section of said clip being futher defined and limited by the following series of equations relating to a series of design parameters for said clip:

$$Z \max = .26 * e^{1.7 * K} \quad \text{Equation 1}$$

$$Z \min = .02 * e^{1.7K} \quad \text{Equation 2}$$

$$Z = \frac{h * t}{bi * ti} \quad \text{Equation 3}$$

$$K = \frac{h^2 * (40.5 * (R6^2 - R2^2) - .06 * (R6 - R2) + 1)}{A - (h - ti)^2 * \text{TAN(Alpha)}} \quad \text{Equation 4}$$

wherein said design parameters are defined as follows:

A is the cross sectional area measured in square inches;

H is the height of the cross sectional shape of the clip measured in inches;

bi is the width of the head of the cross sectional shape measured in inches;

ti is the height of the head of the cross sectional shape measured in inches;

t is the width of the upright portion of the cross sectional shape measured in inches;

R6 is the radius between the upright portion and head of the cross sectional shape measured in inches;

R2 is the radius measured in inches of the transition of the side of the head with the lower flat of the head as seen in FIG. 4; and

Alpha is the angle measured in degrees between a vertical line and the side of the upright portion of the cross section, said cross sectional shape of the clip being generally symmetrical about a plane through the head and leg and generally parallel to the crown and legs; and

the value of Z generated in Equation 3 will fall between Z min and Z max generated from Equation 2 and 3 respectively, using the value of K from Equation 4;

said equations interrelating said design parameters so as to define a limited family of said clip configurations.

4,525,899

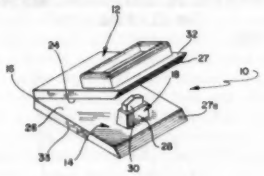
PAPER FASTENER

Richard A. Carroll, Cranston, R.I., assignor to Quality Services Incorporated, Cranston, R.I.

Filed Jun. 27, 1983, Ser. No. 507,999

Int. Cl.³ B42F *3/00*

U.S. Cl. 24—67 P **1 Claim**



1. A fastener for paper and the like comprising:

(a) a first plate member made of a plastic material and having a slot therethrough, said first plate member having a mating surface and having a second surface which is opposite said mating surface;

(b) a second plate member made of said plastic material and having a mating surface;

(c) a living hinge integrally interconnecting said first and second plate members so that they are positionable with the mating surfaces thereof in mating relation;

(d) a prong integrally formed with said second plate member and projecting from the mating surface thereof, said prong being configured and dimensioned to be received in frictional interengagement in said slot when said first and second plate members are positioned with the mating surfaces thereof in mating relation, whereby said first and second plate members are securable in a closed position wherein the mating surfaces thereof are in mating relation so that a sheet of paper or the like disposed between said surfaces is penetrated by said prong and thereby retained in said fastener; and

(e) a frame integrally formed with said first plate member and extending around the periphery of said slot on the second surface of said first plate member, said frame being dimensioned so that when said prong is received in interengagement in said slot, said frame projects outwardly from said first plate member second surface a greater distance than said prong.

4,525,900

TENSIONING DEVICE, ESPECIALLY FOR LASHING CHAINS

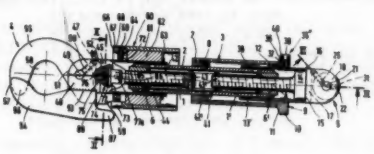
Anton Müller, Aalen-Unterkochen; Hubert König, and Karl Herdeg, both of Aalen, all of Fed. Rep. of Germany, assignors to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 431,603

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1981, 3142474

Int. Cl.³ F16B *7/12*

U.S. Cl. 24—68 CT **22 Claims**



1. A tensioning device especially for lashing chains used for example to lash goods of cargo in transport planes and vehicles subject to vibrations that can cause loosening thereof, including at least one tensioning spindle having at least one end and having an axial direction; a link member respectively provided at said end of said tensioning spindle; a housing arranged coaxially with respect to said tensioning spindle that extends at least partially therein; a nut for adjustably shifting said at least one tensioning spindle and extending co-axially at least partially into said housing; a support bearing upon which said housing is arranged; and actuating element which is supported on said bearing and is non-rotatably connected with said nut for rotation of said nut; and the improvement therewith which comprises:

at least one damping element that absorbs vibrations and is connected with said actuating element; and

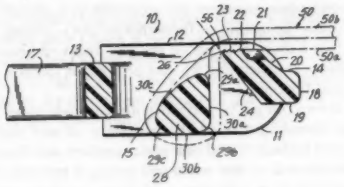
a spring means that applies force thereof to said damping element and that is pressed against said housing transverse to the axial direction of said spindle, said tensioning device and said damping element therewith maintaining tension of the lashing chains connected therewith so that the lashed goods are held securely.

4,525,901

BUCKLE HAVING IMPROVED WEB SECUREMENT

Mark J. Krauss, New York, N.Y., assignor to American Cord & Webbing Co., Inc., New York, N.Y.

Filed Nov. 23, 1983, Ser. No. 554,545
Int. Cl.³ A44B *11/02*
U.S. Cl. 24—200 9 Claims



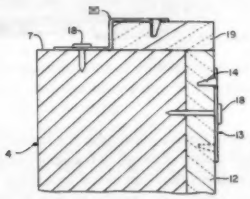
1. A buckle for improved securing of a web comprising opposing side walls, first and second opposing end walls attached to said side walls, said first end wall comprising an upper surface and having a corner edge forming an angle of less than 90° with said upper surface, and a cross-bar integrally connected to said side walls and fixedly disposed in relation to the corner edge, and wherein said cross-bar has a generally triangular cross section, and wherein one angle of the cross section triangle is facingly disposed to said corner edge, and the other angles of said triangle are remotely disposed from said corner edge, whereby the web overlies two entire sides and the two remotely disposed angles of the tirangle with a portion of the web engaging the corner edge.

4,525,902

METHOD AND MEANS FOR ATTACHING INSULATION TO A MOLD

Harry M. Haytayan, Lincoln, Mass., assignor to Pneutek, Inc., Hudson, N.H.

Division of Ser. No. 368,659, Apr. 15, 1982,. This application Mar. 26, 1984, Ser. No. 594,393
Int. Cl.³ E04B *1/38*; F16B *5/06*
U.S. Cl. 24—350 1 Claim



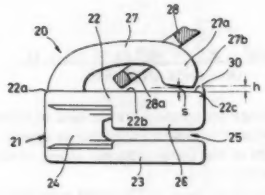
1. A clip for fastening insulation to a mold, said clip comprising first, second and third portions each having first and second opposite sides, said first and third portions being integral with opposite ends of said second portion, said second portion extending (a) away from said first side of said first portion at a right angle, and (b) away from said second side of said third portion at a right angle, and said third portion having at least one tang projecting outward from said second side thereof, in order that when a board-like piece of insulation is placed against a surface of a mold, said clip may be pressed against said mold and said insulation so that said second side of said first portion of said clip will engage said mold surface while said second side of said second portion of said clip and said second side of said third portion of said clip will engage said insulation and said at least one tang will penetrate into said insulation, whereby said clip will hold said insulation to said mold when said first portion of said clip is attached to said mold.

4,525,903

SLIDER FOR SLIDE FASTENER

Susumu Ishii, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,316
Claims priority, application Japan, Nov. 7, 1981, 56-166252[U]
Int. Cl.³ A44B *19/26*
U.S. Cl. 24—429 1 Claim



1. A slider for a slide fastener having a pair of opposed coupling element rows, said slider comprising:

(a) a slider body including an upper and a lower wing joined at the front ends by a neck so as to define a Y-shaped guide channel between said upper and lower wings for the passage of the coupling element rows;

(b) an arch-shaped lug disposed on a top surface of said upper wing, projecting from the front end of said upper wing and terminating longitudinally short of a rear end of said upper wing, said arch-shaped lug having a free end directed toward the top surface of said upper wing and spaced therefrom by a gap of predetermined size;

(c) a pull tab having an opening, said arch-shaped lug extending loosely through said opening to thereby pivotably connect said pull tab to said slider body; and

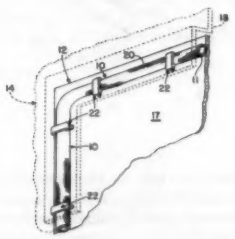
(d) a ridge projecting from said rear end of said upper wing adjacent to said arch-shaped lug, said ridge having a width not less than the width of said free end of said arch-shaped lug and having a height not less than the size of said gap, a portion of said ridge lying to the rear of said gap extending between the rearmost end of said lug and said top surface of said upper wing.

4,525,904

RF GASKET RETAINER CLIP

Hector D. Petri, Framingham, Mass., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 21, 1984, Ser. No. 582,194
Int. Cl.³ F16L *3/08*
U.S. Cl. 24—458 10 Claims



1. A one-piece snap-in fastener of resilient deformable material for holding a deformable resilient gasket against a panel by

snapping into a symmetrically-shaped aperture formed in said panel, comprising an elongate bight portion, a pair of integral leg portions extending angularly from the opposite ends of said bight portion, a pair of inwardly extending feet portions integrally formed at the free end of said leg portions, said feet portions generally extending towards each other and said feet portions having a combined length less than the length of said bight portion to provide an entryway for inserting said gasket, where said bight portion, said leg portions and said feet portions lie in a common straight plane, and a pair of resilient wing portions intergrally formed at the free end of said feet portions and diverging from opposite side of said common plane, where the distance spanned by said leg portions is slightly smaller than said aperture and where said wing portions generally extend perpendicular to said aperture when said fastener is inserted into said aperture.

4,525,905

APPARATUS FOR BEAMING ELASTIC THREADS

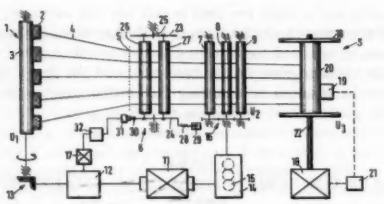
Bogdan Bogucki-Land, Offenbach, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,380

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128538

Int. Cl.³ D02H *13/14*

U.S. Cl. 28—185 **6 Claims**



1. An arrangement for transferring with respect to a beam elastic threads having a predetermined initial extension comprising:

a spool creel having a plurality of spools for carrying said elastic threads;

first means for engaging and driving said spools to impart a first thread speed to said threads being transferred, said first means including at least one payout roller coupled to said spools for delivering said thread at a circumferential speed corresponding to said first speed;

at least one tension roller rotatably mounted between said beam and said first means for imparting a second thread speed to said threads and for stretching them; and

drive means coupled to said first means and said tension roller for driving them, said drive means being operable to provide adjustable speeds, said first and second thread speeds being provided with an adjustable speed ratio by said drive means, said drive means including:

control means for measuring the tension of the threads traveling to said tension roller, said control means including means for adjusting the speed ratio between said first and second speeds, said control means being coupled to said drive means and through it being operable to alter said speed ratio in response to the tension of said threads, to hold said tension at a predetermined magnitude; and

a speed controller having a constant speed motor, and variable means having an input and output for converting speed therebetween, said motor and said variable means each having an output shaft, the output shaft of said variable means being powered by said motor to a speed varying from that of said motor, said payout roller and tension roller each being driven by a different corresponding one of said output shafts.

4. An arrangement for transferring with respect to a beam elastic threads having a predetermined initial extension comprising:

a spool creel having a plurality of spools for carrying said elastic threads;

first means for engaging and driving said spools to impart a first thread speed to said threads being transferred, said first means including at least one payout roller coupled to said spools for delivering said thread at a circumferential speed corresponding to said first speed;

at least one tension roller rotatably mounted between said beam and said first means for imparting a second thread speed to said threads and for stretching them; and

drive means coupled to said first means and said tension roller for driving them, said drive means being operable to provide adjustable speeds, said first and second thread speeds being provided with an adjustable speed ratio by said drive means, said drive means including:

control means for measuring the tension of the threads traveling to said tension roller, said control means including means for adjusting the speed ratio between said first and second speeds, said control means being coupled to said drive means and through it being operable to alter said speed ratio in response to the tension of said threads, to hold said tension at a predetermined magnitude;

at least one balance roller;

a frame supporting said balance roller, said frame and balance roller being rotatable in the same direction about spaced axes;

bias means for rotating said frame in a predetermined direction to urge said roller against said threads; and

transducer means coupled to said control means for providing thereto a position signal responsive to positioning of said frame, said control means being operable to adjust said adjustable speed ratio in response to said position signal.

4,525,906

DEVICE FOR DRAWING WARP THREADS INTO READIED HEDDLES AND DROP WIRES

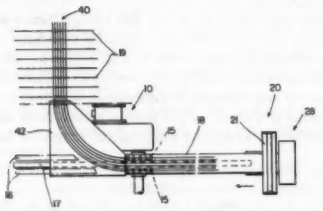
Claus Tovenrath, and Florian Windischbauer, both of Lindau, Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 428,769

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210921

Int. Cl.³ D03J *1/14*

U.S. Cl. 28—205 **9 Claims**



1. In an apparatus for drawing warp threads out of a warp thread curtain in a predetermined position into readied heddles and drop wires with the aid of a plurality of draw-in needles arranged in parallel to one another and movable back and forth relative to said curtain of warp threads for passing through eyes of said heddles and drop wires, the improvement comprising movable carriage means (20), fixed guide means for guiding movements of said carriage means, said fixed guide means comprising needle bed means arranged for cooperation with

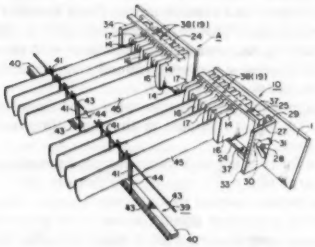
said carriage means, guide grooves in said needle bed means for holding said plurality of draw-in needles in said guide grooves in a movable, guided manner for moving and guiding said draw-in needles (**40**) back and forth relative to said warp threads, drive means (**10**) operatively connected to said carriage means (**20**) for displacing said carriage back and forth in a reciprocating manner, coupling means (**23**) for selectively coupling any one of said draw-in needles to said carriage means for guided movement with said carriage means along said guide means, and control means (**28**) operatively arranged for cooperation with said coupling means for controlling a selective coupling operation.

4,525,907

DEVICE FOR ASSEMBLING BLINDS

Takeyoshi Tachikawa, Yokohama, Japan, assignor to Tachikawa Blind Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 518,903
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—24.5 **17 Claims**



1. Apparatus for assembling blinds of the type having slats arranged with ladder cords of the type having elongated cord parts joined to transverse cord parts, comprising an elongated support means, bridge means mounted on said support means for receiving end portions of a plurality of said slats and retaining said slats in spaced array, operable means for operating each of said bridge means between open and closed portions, said bridge means in said open position being operable to receive an end portion of a slat, said bridge means in said closed position being operable to clampingly retain the slat in a fixed position, said plurality of bridge means being positioned on said support means to provide a transverse space between each of said bridge means, said ladder cord being disposed about said bridge means such that said transverse cord parts are located in said transverse spaces between said bridge means as said elongated cord parts straddle said plurality of bridge means, said ladder cord being disposed about said bridge means before said slats are received by said bridge means such that after said slats are recieved and clampingly retained in said bridge means, said ladder cord is slid off of the bridge means onto the slats to a desired position along the longitudinal length of said slats.

4,525,908

MANUALLY OPERABLE UNIVERSAL KEY CODE CUTTING DEVICE

Victor H. Bernstein, Oxnard, Calif., assignor to Tri County Tool Inc., Ventura, Calif., a part interest

Filed Aug. 18, 1983, Ser. No. 524,415
Int. Cl.³ B23D *69/02*
U.S. Cl. 29—76 C **5 Claims**

1. A manually operable universal key cutting device including, in combination:

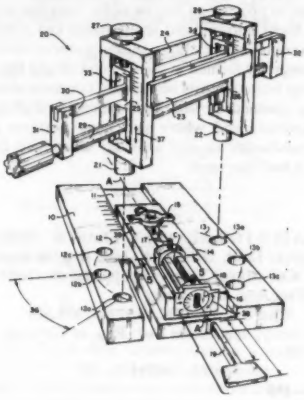
(a) a base plate;

(b) longitudinally extending means on said base plate;

(c) a key vise carriage plate mounted on said longitudinally extending means for longitudinal movement along said base plate;

(d) a supporting means extending upwardly from said base plate; and

(e) a key file guide vertically movable in said supporting means whereby when a file is received in said key file



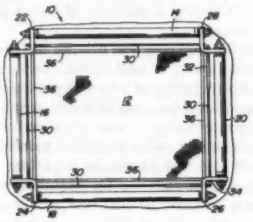
guide and a blank key held in said key vise carriage plate, the spacing of successive cuts on the key blank by said file can be adjusted by adjusting the longitudinal position of the carriage plate on the base plate and the depth of cut can be adjusted by adjusting the vertical position of said file guide in said supporting means.

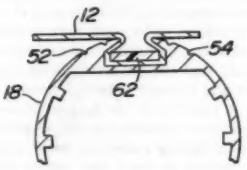
4,525,909

ROLLER FOR SCREEN TENSIONING AND PRINTING FRAME

Don Newman, Wyncote, Pa., assignor to Stretch Devices, Inc., Philadelphia, Pa.

Filed Sep. 30, 1982, Ser. No. 429,752
Int. Cl.³ D06C *3/08*
U.S. Cl. 29—121.1 **7 Claims**





1. A roller for a screen tensioning and printing frame com-

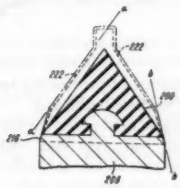
prising a roller having means thereon for locking thereto a portion of fabrics which are in a range from fine down to fabrics which are coarse, said means including a longitudinally extending peripheral locking groove to facilitate locking a portion of a fabric thereto, said groove being symmetrical and having an open gap at the periphery of the roll and a flat base surface radially inwardly of the gap, side walls on opposite sides of the groove including flat surfaces converging to the gap, the included angles between said base surface and said converging surface being about 25° to 60°.

4,525,910

RESILIENT TIPPED NEEDLE VALVE

Dennis A. Boehmer, Xenia, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Aug. 8, 1983, Ser. No. 520,976
Int. Cl.³ F16K *1/34*
U.S. Cl. 29—156.7 R **5 Claims**



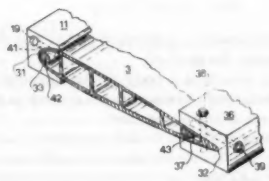
1. A method of making a needle valve having a rigid body and a resilient conical tip, said method comprising the steps of:
providing a rigid body having a tip receiving cylindrical part extending axially from one end thereof, said cylindrical part including tip retaining means;
molding a resilient, substantially conical tip onto said cylindrical part, said tip engaging said tip retaining means to secure said tip to said cylindrical extension; and
grinding said tip until the outer edge of said cylindrical part of said rigid body is engaged to remove a portion thereof to form a single angle conical tip having a base dimension substantially equal to the diameter of the removed portion of said cylindrical part whereby any molding distortions of said tip are eliminated to assure a sealing diameter substantially equal to the base dimension of said single angle conical tip.

4,525,911

METHOD AND APPARATUS FOR ATTACHING BLADES TO ROTATING STRUCTURES

Steve S. Sisson, Seattle; Olivier L. Tremoulet, Jr., Edmonds, and John E. Mercer, Kent, all of Wash., assignors to FloWind R & D Partnership, Kent, Wash.

Filed Apr. 22, 1983, Ser. No. 487,854
Int. Cl.³ B23P *15/02*
U.S. Cl. 29—156.8 R **16 Claims**



1. A method for attaching a blade having a leading edge and a trailing edge to a shaft comprising the steps of:
clamping a first member onto the trailing edge of the blade, and
clamping a second member onto the leading edge of the blade, and
attaching said first member and said second member to the shaft.

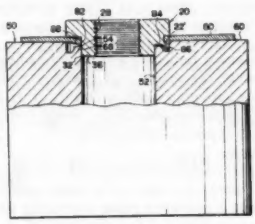
8. An apparatus for attaching a blade having a leading and a trailing edge to a shaft comprising:
clamping means adapted for attachment to the leading edge of said blade, and
further clamping means adapted for attachment to the trailing edge of said blade, and
attachment members for attaching said clamping means and said further clamping means to the shaft.

4,525,912

PIERCE NUT AND A BACK-UP DIE USED IN COMBINATION THEREWITH

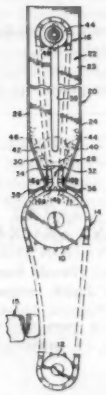
Hiroshi Kazino, Komaki; Hiroshi Isomura, Kounan, and Kozo Mizuno, Aichi, all of Japan, assignors to Kabushiki Kaisha Aoyama Seisakusho, Nagoya, Japan

Filed May 9, 1983, Ser. No. 492,674
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—243.52 **3 Claims**



1. A combination of a pierce nut to be secured to a metal sheet and a back-up die for securing the nut to a metal sheet comprising a cylindrical body and a laterally extending flange integrally formed with the cylindrical body, characterized in that:
a plurality of projections are integrally formed with said cylindrical body on an outer surface thereof;
each of said projections axially extending from an under surface of the flange to a position short of a bottom edge of the cylindrical body;
said back-up die having a center bore formed in the die body and having a slightly larger diameter than that of a pilot portion of the cylindrical body of the pierce nut;
an annular groove being formed coaxially with the center bore on the top of the back-up die;
an annular bank portion to deform the projections of the pierce nut being formed between the center bore and the annular groove;
a vertical cross-sectional configuration of the annular groove being defined by an upstanding wall substantially vertically extending from the top surface of the back-up die to a position situated lower than the top edge of said center bore;
a bottom wall radially inwardly extending from said position at which said upstanding wall ends;
an inclined wall inwardly and upwardly extending from said bottom wall to a position which is substantially the same height as the top edge of said center bore; and
a radially inwardly extending top wall connecting said inclined wall and the top edge of said center bore and being positioned lower than the top surface of the back-up die.

4,525,913
CHAIN REPLACEMENT APPARATUS
Blair S. Krukowski, 20009 SE. Stark, Portland, Oreg. 97233
Filed Apr. 15, 1982, Ser. No. 368,761
Int. Cl.[3] B25B *27/00*
U.S. Cl. 29—270 **8 Claims**



1. Apparatus for replacing a mounted endless chain having a pair of adjacent connected and disconnectible links where a portion of the mounted chain is trained over a sprocket, with the pair of disconnectible links being positionable on the sprocket, said apparatus comprising

a frame plate,

a pair of chain-abutments mounted on one side of the frame plate adjacent one end of the frame plate, said abutments occupying a common plane and being spaced from each other in said plane and facing outwardly from said one end of the frame plate, said abutments and said one end of the frame plate forming a pocket adapted to receive a portion of the sprocket and the mounted chain trained thereon, with a pair of disconnectible links being positionable in said pocket with the connection between the pair of disconnectible links being unobstructed radially outwardly from the sprocket by said abutments, said pocket further being open laterally of the plane of said abutments sufficiently to expose, when a portion of a sprocket and a mounted chain trained thereon is received in the pocket, at least a pair of links in the chain disposed between the abutments,

said abutments defining an opening between them adapted with disconnection of the mounted chain when such extends between the abutments to receive the disconnected chain ends produced by the disconnection of the mounted chain, and

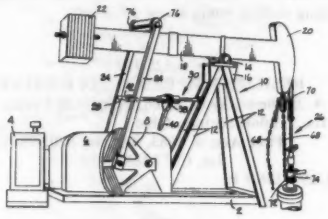
chain support means mounted on said frame plate spaced towards an end of the frame plate opposite said one end for supporting a replacement chain while such replacement chain is being connected to the disconnected chain ends of the mounted chain.

4,525,914
METHOD AND APPARATUS FOR REPLACING BEARINGS
Larry E. Bryan, Sumner; Richard W. Grove, Bridgeport, both of Ill., and William F. Primus, Vincennes, Ind., assignors to Marathon Oil Company, Findlay, Ohio
Filed May 4, 1983, Ser. No. 491,513
Int. Cl.[3] B23P *7/00*
U.S. Cl. 29—402.08 **2 Claims**

1. A method for replacing the bearing between the sampson post and the walking beam of an oil well pump having a head portion secured to one end of the walking beam, a counterweight on the other end of the walking beam and pitman arms for operating the walking beam comprising:

securely fastening the sampson post and the pitman arms together to prevent relative movement between the sampson post and pitman arms;

adjustably securing the head portion at a predetermined position;



loosening the connection of the bearing between the sampson post and the walking beam; and

adjusting said adjustable head portion securing means so that the counterweight will pivot said walking beam away from said sampson post an amount sufficient to allow said loosened bearing to be removed and a new bearing installed.

4,525,915
THREAD COVER FOR PROTECTING A SEAL
Roy L. Rich, P.O. Box 143, Pecos, Tex. 79772
Filed Nov. 4, 1983, Ser. No. 548,690
Int. Cl.[3] B23P *17/00*; **B25B** *27/14*
U.S. Cl. 29—423 **15 Claims**

15. Method of entering a threaded end of a shaft into a seal means comprising the steps of:

magnetically attaching a body to the threaded end of the shaft with the body having an axial centerline aligned with the axial centerline of the shaft;

attaching elongated, thin, flexible members to said body and arranging said flexible members to lie adjacent to the outer surface of said body and to extend rearwardly to enclose most of the threads of the threaded shaft end; said body having a diameter which does not exceed the diameter of the shaft end;

extending the body and shaft end through the seal means; and then removing the body from the end of the shaft.

4,525,916
METHOD OF COUPLING COAXIAL SHAFTS

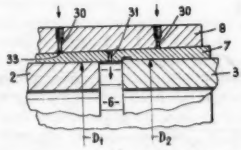
Wolfgang Wührer, Ravensburg, Fed. Rep. of Germany, assignor to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Sep. 2, 1983, Ser. No. 529,135

Claims priority, application Switzerland, Sep. 8, 1982, 5332/82

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—446 **13 Claims**



1. A method of coupling together confronting end portions of two substantially coaxially arranged shafts, comprising the steps of:

mounting a shaft coupling having coacting inner and outer sleeves with tapered contact surfaces between the inner and outer sleeves such that the end portions of the shafts extend into the inner sleeve which is surrounded by the outer sleeve;

infeeding a hydraulic pressurized fluid medium from a region of at least one support portion of the shaft coupling which is located remote from the confronting end portions of the shafts between the tapered contact surfaces of said inner and outer sleeves;

permitting the infed hydraulic pressurized fluid medium to flow along an interface between said tapered contact surfaces towards a region where the hydraulic pressurized fluid medium can experience a reduction in pressure and which region is located in a plane extending between the confronting end portions of the shafts;

radially moving the outer sleeve away from the inner sleeve due to the action of the infed hydraulic pressurized fluid medium;

axially displacing the outer sleeve in a predetermined mounting direction and compressing the inner sleeve against the confronting end portions of the shafts; and

discontinuing the flow of hydraulic pressurized fluid medium through the interface between said tapered contact surfaces, to thereby positively interconnect the two end portions of the shafts in torque-transmitting relationship with one another.

4,525,917
PROCESS FOR PREPARING RIMMING OR SEMI-KILLED STEEL INGOTS FOR ROLLING INTO SLABS

James R. Cook, and Thomas R. Dishun, both of Middletown, Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Mar. 24, 1983, Ser. No. 478,451

Int. Cl.³ B21B *15/00*

U.S. Cl. 29—527.7 **13 Claims**

1. A process of rolling rimming or semi-killed steel ingots to slabs with minimum energy consumption, improved yield and optimum metallurgical quality, comprising the steps of:

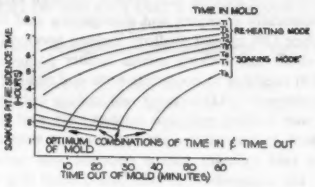
providing a model to determine projected ingot thermal profile and time at which an ingot is ready to roll on the basis of at least ingot size, time of the ingot in its mold, and initial soaking pit temperature;

removing said ingot from its mold before solidification of the center of said ingot but after formation of a solidified outer rim of sufficient thickness to maintain the original shape of said ingot;

charging said ingot to a soaking pit and closing said pit;

determining from said model if heating of said soaking pit, after a predetermined lapse of time, is required before attaining a ready-to-roll condition;

holding said ingot in said soaking pit for the minimum time required to reach a condition wherein more than 85% of the ingot is solidified;


TIME IN MOLD
RE-HEATING MODE
"SOAKING MODE"
SOAKING PIT RESIDENCE TIME (HOURS)
OPTIMUM COMBINATIONS OF TIME IN & TIME OUT OF MOLD
10 20 30 40 50 60
TIME OUT OF MOLD (MINUTES)

removing said ingot from said soaking pit when the outer rim of said ingot attains a temperature up to about 525 Fahrenheit degrees cooler than said ingot center and the remainder of said ingot attains a temperature at least as high as the rolling temperature desired for the particular grade of steel; and

rolling said ingot into a slab.

4,525,918
TWO COMPONENT TOOL HOLDER, ESPECIALLY FOR A MACHINE TOOL OR ROBOT

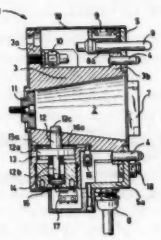
Wolfgang Puritz, Buxtehude, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,661

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1982, 3214025

Int. Cl.³ B23Q *3/155;* **H01R** *4/50*

U.S. Cl. 29—568 **9 Claims**



1. A two component tool holder for a robot, said tool holder having a central longitudinal axis, comprising a first component (**1**) including a sleeve (**3**) with a conical bore (**2**) in the sleeve, and a second component (**25**) with flange means (**27, 28**) for holding a tool and with a conical shaft (**26**) fitting into said conical bore (**2**), said conical shaft having substantially adjacent its free end a circumferential shallow locking groove (**29**) having a first conical ring surface (**30**) slanting toward a plane defined by said free end, a second conical ring surface (**31**) slanting away from said plane defined by said free end, and a cylindrical groove bottom forming together with said first and second slanting ring surfaces said shallow locking groove (**29**), said holder further comprising shaft locking means including at least two locking bolts (**12**) arranged for moving perpendicularly to said central longitudinal axis through said sleeve (**3**) into said locking groove (**29**) when the conical shaft is in said conical bore, each of said locking bolts (**12**) having a conical tip (**12***c*) with a slant for contacting only said first conical ring surface (**30**), whereby a movement of said conical tip (**12***c*) along said ring surface (**30**) causes a form locking of the lock-

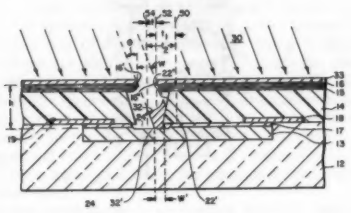
ing bolts (12) with the conical shaft (26) for pressing the latter firmly into said conical bore (2), said locking means comprising for each locking bolt (12) a piston (12*a*) including a piston rod directly forming said locking bolt (12) and cylinder means constructed in said sleeve (3) so that said tip (12*c*) of said piston rod forming said locking bolt extends through said sleeve (3) for automatically engaging and disengaging said first conical ring surface (30) of said shallow locking groove (29) in said conical shaft, said locking means further comprising spring means (14) arranged to cooperate with said piston (12*a*) opposite said piston rod (12) forming said locking bolt for normally pushing said locking bolt into contact with said first conical ring surface, except when a pressure medium is applied to said piston in said cylinder means opposite said spring means, whereby the engagement of said first conical ring surface by said locking bolt is effective even when a supply of said pressure medium fails, said tool holder further comprising corresponding connector means (18, 33; 7, 32) including at least one connector element located on each of the first and second tool holder components, said connector elements cooperating with each other for automatically providing a power and control supply for a tool held by said tool holder when the first and second tool holder components are brought into cooperation with each other.

4,525,919

FORMING SUB-MICRON ELECTRODES BY OBLIQUE DEPOSITION

Walter Fabian, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 16, 1982, Ser. No. 388,841
Int. Cl.³ H01L *21/285*
U.S. Cl. 29—571 **7 Claims**



2. A method of forming a field effect transistor on a substrate having source and drain electrodes disposed on source and drain contact regions and a gate electrode therebetween comprising the steps of:

providing a composite mask on the substrate comprising first and second different masking layers;

forming an aperture in the composite mask exposing a portion of the substrate between the source and drain contact regions and undercutting sidewall portions of said first masking layer to provide overhanging portions of said second masking layer;

directing an obliquely angled stream of conductive material at the substrate; and

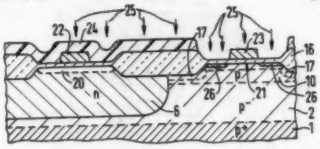
depositing such directed stream of conductive material through the aperture onto the substrate to provide the gate electrode, with said overhanging portions isolating the material of the gate from material deposited on the mask.

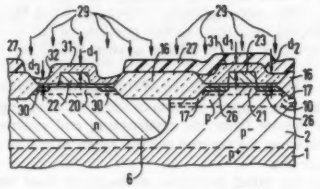
4,525,920

METHOD OF MAKING CMOS CIRCUITS BY TWIN TUB PROCESS AND MULTIPLE IMPLANTATIONS

Erwin P. Jacobs, Vaterstetten, and Ulrich Schwabe, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,639
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314450
Int. Cl.³ H01L *21/22, 29/78, 21/263*
U.S. Cl. 29—571 **14 Claims**





1. A method for manufacturing VLSI complementary MOS field effect transistor circuits wherein n-doped tubs are generated in a silicon substrate for acceptance of p-channel transistors of the circuit, corresponding dopant atoms being introduced into said tubs by means of multiple ion implantations for setting various transistor threshold voltages, comprising the steps of:

(a) applying a first double layer comprising silicon oxide and silicon nitride to a p-doped silicon substrate;

(b) manufacturing the n-doped tubs by means of an ion implantation after completion of masking of remaining regions with a photoresist mask and after removal of the silicon nitride layer at the n-tub region, the implantation utilizing one of the elements selected from the group consisting of phosphorous, arsenic, and antimony;

(c) stripping the photoresist mask;

(d) performing a local oxidation process for generating a masking oxide for a following deep boron implantation outside of the n-tub region and first in-diffusion step of the phosphorous, arsenic or antimony ions;

(e) stripping the silicon nitride structures followed by a selective drive-in of the n-tub;

(f) executing a first boron ion implantation;

(g) providing a surface-wide stripping of the oxide mask;

(h) applying a second double layer comprising silicon oxide and silicon nitride to the substrate surface and structuring the silicon nitride layer covered with a photoresist mask such that n-channel and p-channel active transistor regions to be formed remain covered by the silicon nitride layer;

(i) stripping the photoresist mask;

(j) applying a further photoresist layer over the n-tub regions;

(k) executing a second boron ion implantation for generating n-channel field-implanted regions;

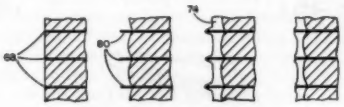
(l) stripping the photoresist structures;

(m) generating the field oxide regions by means of local oxidation by use of the silicon nitride layer as mask;
(n) removing the silicon nitride layer and the oxide layer lying therebelow and executing an oxidation process for manufacturing the gate oxide;
(o) executing a third, surface-wide boron ion implantation for doping the n-channel and the p-channel whereby the implantation dosage is selected in conformity with the other implantations such that as symmetrical as possible a threshold voltage $|U_T|$ is achieved for the n-channel and the p-channel transistors;
(p) depositing and structuring gate regions on the gate oxide at the transistor regions;
(q) to create source/drain regions for the n-channel transistors, executing an ion implantation in the n-channel transistor region after masking the n-tub regions with photoresist, said ion implantation utilizing one of the elements selected from the group consisting of arsenic and antimony;
(r) executing an oxidation process after stripping the photoresist masking such that an oxide layer thus created in the n-tub region does not mask a subsequent source/drain implantation of the p-channel transistors but such that it can have a masking effect in a region of edges of the polysilicon gate;
(s) executing a photoresist technique for masking the n-channel transistor region;
(t) executing a fourth boron ion implantation for generating the source/drain regions of the p-channel transistors;
(u) removing the photoresist masking; and
(v) depositing an insulating layer, etching a contact hole therein, and forming a metal interconnect level thereafter.

4,525,921
HIGH-DENSITY ELECTRONIC PROCESSING PACKAGE-STRUCTURE AND FABRICATION

John C. Carson, Corona del Mar, and Stewart A. Clark, Irvine, both of Calif., assignors to Irvine Sensors Corporation, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 282,459, Jul. 13, 1981, abandoned, which is a continuation of Ser. No. 187,787, Sep. 16, 1980, abandoned. This application Jul. 25, 1983, Ser. No. 517,221
Int. Cl.³ H01L *21/90, 21/92*
U.S. Cl. 29—577 C **7 Claims**

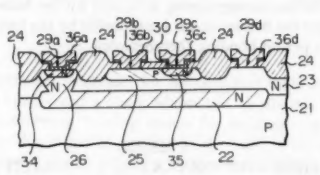


1. A method for fabricating a high-density electronic package having at least one access plane comprising:
providing a number of equal-sized semiconductor chips, each having integrated circuitry thereon, and each having a multiplicity of closely spaced electrical contact points at one end thereof;
stacking and bonding the semiconductor chips to form a rectangular parallelepiped structure with the electrical contact points in an array of closely spaced points on the access plane end of the stacked chips;
etching the access plane ends of the stacked chips to remove a small amount of the body material of the chips while leaving the contact points protruding;
depositing insulation material to cover the etched access plane ends of the stacked chips;
removing sufficient material from the insulation-covered ends of the stacked chips to uncover the electrical contact points; and
connecting a multiplicity of lead-out conductors to the insulation-covered ends of the stacked chips in such a way that each conductor is in electrical contact with one or more electrical contact points, while being otherwise insulated from the body material of the semiconductor chips.

4,525,922
METHOD OF PRODUCING A SEMICONDUCTOR DEVICE

Tadashi Kiriseko, Kanagawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 21, 1983, Ser. No. 544,263
Claims priority, application Japan, Oct. 22, 1982, 57-185508
Int. Cl.³ H01L *21/22, 21/265*
U.S. Cl. 29—577 C **9 Claims**



1. A method of producing a semiconductor device comprising a Schottky barrier diode and a bipolar transistor formed in a semiconductor substrate having an N-type silicon layer formed on the semiconductor substrate and having a P-type base region formed in the N-type silicon layer, the bipolar transistor having an emitter region formed by self-alignment with an emitter electrode contact window and having an emitter electrode connected to the emitter region through a polycrystalline silicon layer formed on the P-type base region, said method comprising the steps of:
(a) selectively etching an insulating layer which is formed on the N-type silicon layer so as to form the emitter electrode contact window in which a portion of the P-type base region is exposed;
(b) forming the polycrystalline silicon layer on at least the exposed portion of the P-type base region formed on the emitter electrode contact window;
(c) introducing N-type impurities into the P-type base region through the polycrystalline silicon layer formed on the emitter electrode contact window; and
(d) defining a base electrode contact window after said step (c) of introducing N-type impurities, in which a portion of the P-type base region is exposed, and defining a contact window for the electrode of the Schottky barrier diode in which a portion of the N-type silicon layer is exposed, by selectively etching through the polycrystalline silicon layer and the insulating layer using a resist layer as a mask.

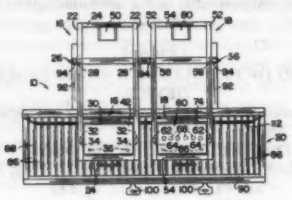
4,525,923
HEAT SEALING MACHINE FOR BONDING BATTERY COVERS AND BATTERY CASINGS TOGETHER

Oscar E. Alvarez, 5700 Mariner S., #701E, Tampa, Fla. 33609

Filed Dec. 19, 1983, Ser. No. 563,146
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—730 **7 Claims**

1. A heat sealing machine for joining a battery casing and battery cover comprising a battery casing heating station and a battery cover preheating station operatively supported on a machine support frame, the battery casing heating station including a battery casing heater support frame pivotally mounted on the machine support frame having a battery casing heater pivotally attached to one end thereof, the battery cover preheating station including a battery support frame having a battery cover preheater pivotally attached to one end thereof, the machine support frame including a plurality of rollers for lateral movement of the individual battery casings thereon to move the heated battery casing laterally from the battery

casing heating station to the battery cover preheating station to receive the preheated battery cover, such that the upper periphery of the battery casing is heated by the battery casing heater and the battery cover is preheated by the battery cover heater to permit bonding therebetween.



4,525,924

METHOD FOR PRODUCING A PLURALITY OF SEMICONDUCTOR CIRCUITS

Horst Schäfer, Zirndorf, Fed. Rep. of Germany, assignor to Semikron Gesellschaft für Gleichrichterbau und Elektronik, Nuremberg, Fed. Rep. of Germany

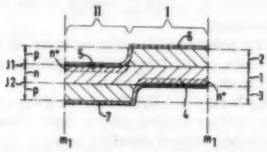
PCT No. PCT/DE79/00145, § 371 Date Aug. 14, 1980, § 102(e) Date Aug. 14, 1980, PCT Pub. No. WO80/01334, PCT Pub. Date Jun. 26, 1980

Division of Ser. No. 204,362, Aug. 14, 1980, abandoned. This PCT application Dec. 11, 1979, Ser. No. 503,078

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2855972

Int. Cl.³ H01L *21/461, 21/80*

U.S. Cl. 29—580 **13 Claims**



1. A method for producing a plurality of semiconductor circuits each consisting of two antiparallel connected diodes, comprising the steps of

preparing a semiconductor element having first and second opposite surfaces, said semiconductor element being of one conductivity type;

diffusing doped material of the opposite conductivity type into both surfaces of said semiconductor element to provide a semiconductor starting disc having first and second pn-junctions formed at the first and second surfaces of said semiconductor element by said diffused doping material;

forming a plurality of groove-shaped mutually parallel recesses in each side of said semiconductor starting disc which penetrate said first and second pn-junctions to expose portions of the surfaces of said semiconductor element, the recesses on one side of said semiconductor starting disc being offset in a direction parallel to the surfaces of said semiconductor element with respect to the recesses on the opposite side of said starting disc;

coating each side of said semiconductor starting disc with at least one contact metal; and

dividing said coated semiconductor starting disc into segments each of which contains two antiparallel connected diodes.

4,525,925

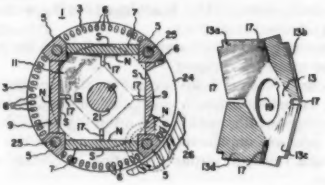
METHOD OF MAKING PERMANENT MAGNET ROTOR

Donald W. Jones, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 534,991, Sep. 22, 1983, Pat. No. 4,472,651. This application Jun. 21, 1984, Ser. No. 622,896

Int. Cl.³ H02K *15/02*

U.S. Cl. 29—598 **2 Claims**



1. A method of assembling a permanent magnet rotor comprising the steps of:

forming a hollow cylinder of arcuate shaped pole pieces of magnetic material separated by nonmagnetic segments;

placing a plurality of magnets inside said cylinder adjacent to said pole pieces, said magnets defining a central axial opening;

placing inside said central axial opening a rotor core having a stack of generally saucer shaped elements; and

compressing said rotor core in the axial direction to tend to flatten said saucer shaped elements to cause radial expansion of the rotor core to hold said magnets against the interior of the hollow cylinder

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4,525,926

MANUFACTURING RECOMBINATION ELECTRIC STORAGE CELLS

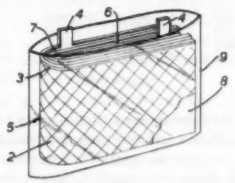
Ernest J. Pearson, Swinton, England, assignor to Chloride Group Public Limited Company, London, England

Filed Oct. 31, 1983, Ser. No. 547,098

Claims priority, application United Kingdom, Oct. 29, 1982, 8230953

Int. Cl.³ H01M *10/12*

U.S. Cl. 29—623.1 **9 Claims**

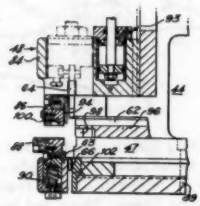


1. A method of manufacturing recombination electric storage cells comprising assembling a plurality of cell packs, said cell packs comprising alternating positive and negative electrodes interleaved with compressible fibrous absorbent separator material, placing each said cell pack in a respective open plastic bag, compressing said cell packs to a volume less than their natural volume, immersing said compressed cell packs in electrolyte thereby substantially saturating said electrodes and said separator material, passing an electric current through each said cell pack to electrolytically form it and then inserting said cell packs into a final outer container, said cell packs being permitted to expand from their compressed volume when in the final container.

4,525,927
METHOD AND APPARATUS FOR CONNECTING AN INSULATING HOUSING OF A CONNECTOR AND A COVER

Jean B. Guerout, Conflans Saint Honorine, and Jack Urbin, Triel, both of France, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 4, 1983, Ser. No. 463,710
Claims priority, application France, Feb. 10, 1982, 82 02153
Int. Cl.[3] H01R *43/04;* B23P *19/00*
U.S. Cl. 29—861 10 Claims



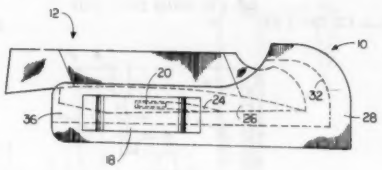
1. A method of terminating respective individual electrical conductors sequentially to respective individual electrical connectors which are detachably coupled together by means of interengaging projection and receptacle members to form a row, comprising the steps of feeding the leading connector of the row of connectors onto a support, inserting a conductor proximate to an electrical terminal of the leading connector, employing a terminating member to terminate the conductor to the electrical terminal of the connector, raising the leading connector relative to a next following connector after the termination of the conductors thereby detaching the leading connector from the next following connector, retracting the next following connector from the leading connector, and transporting the leading connector away laterally of the row of connectors.

4. Apparatus for terminating respective individual electrical conductors sequentially to respective individual electrical terminals of respective individual electrical connectors detachably joined together by means of interengaging projection and receptacle members on housings of the connectors to form a strip of connectors by mating covers with the respective housings with the conductors interposed therebetween, the apparatus comprising a frame, a terminating punch and a connector support anvil mounted on the frame, means operatively associated with the frame to move the punch through a working stroke towards the anvil and through a return stroke away from the anvil, a track on the frame extending to the anvil for accommodating a row of connectors and feed means on the frame adjacent the track arranged to feed the row of connectors along the track towards the anvil to position the leading connector of the row on the anvil when the punch is in a position remote from the anvil, to enable the punch to engage the cover to mate the housing of the leading connector therewith during the working stroke of the punch, which apparatus further includes a magazine on the frame arranged to accommodate a column of the covers extending towards the anvil, means on the frame for feeding the column of covers in the direction of the anvil to position the leading cover of the column at a location between the punch, when in its position remote from the anvil and the anvil, means on the frame adjacent the anvil to releasably retain the leading cover in such location, for displacement towards the leading connector by the punch and means on the frame arranged to displace the leading connector towards the punch when the housing of the leading connector has been mated with the leading cover and the punch has been withdrawn from the leading cover, thereby to disengage the leading connector from a strip of the connectors to which the leading connector is detachably connected.

4,525,928
BLADE OPENING SCABBARD FOR FOLDING KNIFE

John E. Foster, 10433 Malibu Ct., Baton Rouge, La. 70818

Filed Sep. 8, 1983, Ser. No. 530,407
Int. Cl.[3] B26B *29/02*
U.S. Cl. 30—158 20 Claims

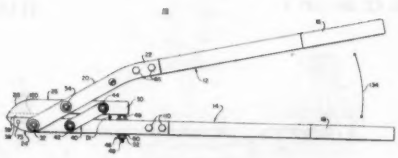


1. A knife and scabbard for holding said knife, said knife having a handle and a blade adapted to be pivoted into said handle, comprising holding means for holding said knife in position so that it can be grasped by the hand of the user, said scabbard having a top end and a bottom end, said top end being open and said bottom end being closed, said scabbard having knife blade holding means for holding said knife blade in said scabbard parallel to said scabbard as said handle is being pivoted about said knife blade and said blade is being withdrawn from said scabbard, said knife blade having slits therein for engaging said knife blade holding means.

4,525,929
CUTTING DEVICE

H. Joseph Brophy, Sr., and H. Joseph Brophy, Jr., both of 9 Garrison Ave., Somerville, Mass. 02144

Filed Sep. 27, 1982, Ser. No. 423,712
Int. Cl.[3] B26B *17/02, 13/26*
U.S. Cl. 30—181 27 Claims



1. An improved cutting device comprising:

first and second handles, each having a gripping end and a distal end opposite said gripping end, and a movable jaw having forward and rearward portions;

a stationary jaw fixed to said first handle, said second handle including first pivot means proximate said distal end thereof for connecting said second handle to said stationary jaw and second pivot means spaced longitudinally from said first pivot means and disposed between the gripping end thereof and said first pivot means for connecting said second handle to said movable jaw for providing slicing action between said jaws, at least one of said jaws including a cutting edge; and

means, spaced from said first and second pivot means and engaging the rearward portion of said movable jaw, for constraining motion of said rearward portion of said movable jaw and amplifying the closing leverage applied to said jaws by said handles through said first and second pivot means when said handles are pivoted together.

4,525,930

APPARATUS FOR CARRYING MACHINE ELEMENTS

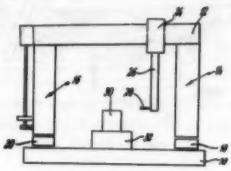
James Bury, Derby, England, assignor to L.K. Tool Company Limited, Derbyshire, England

Filed Feb. 12, 1982, Ser. No. 348,547

Claims priority, application United Kingdom, Feb. 14, 1981, 8104696

Int. Cl.[3] G01B 5/03, 7/03

U.S. Cl. 33—1 M 9 Claims



1. Apparatus for carrying machine elements, said apparatus comprising a base, a bridge structure comprising spaced support legs and a bridge extending therebetween, bearings mounting the support legs on the base, carriage means movable on the bridge, and means compensating for the effects on the bearings due to varying forces on the support legs resulting from movement of the carriage means, the compensating means comprising an arrangement effective at an end of the bridge structure for mechanically transmitting movement of the carriage means into a change in height of the bridge structure at or towards said end above the base, independent of variation of the pressure of the bearings.

4,525,931

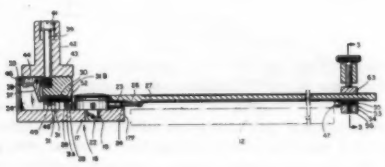
GAGE ASSEMBLY

Larry C. Wilkins, New Albany, Ind., assignor to Electromechanical Research Laboratories, Inc., New Albany, Ind.

Filed Sep. 1, 1983, Ser. No. 528,550

Int. Cl.[3] G01B 3/38

U.S. Cl. 33—147 T 11 Claims



1. A gage assembly comprising:

an elongate bar for bridging a part to be measured;

contact means provided at spaced locations on said bar and comprising an anvil to engage one margin of a part to be measured, and a gage operating plunger having a plunger tip to engage an opposite margin of the part to be measured; and

a retractor assembly mounted at one end of the bar and located entirely outside the space between said anvil and plunger tip, said retractor assembly including a plunger retractor engageable with said plunger, and handle means operatively associated with said plunger retractor to enable said retractor to automatically retract the said plunger tip when the gage assembly is lifted by said handle means to place said gage assembly onto the part to be measured or to remove said gage assembly from the part to be measured.

4,525,932

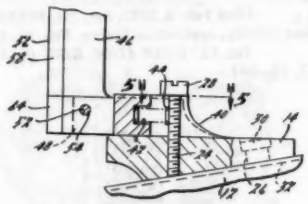
FOLDING FIREARM SIGHT

Paul D. Williams, 9241 Davison, Davison, Mich. 48423

Filed Dec. 9, 1983, Ser. No. 559,749

Int. Cl.[3] F41G 1/40

U.S. Cl. 33—256 1 Claim



1. A folding sight for a firearm adapted to be movable from a storage to an operational position, said sight comprising;

a base adapted to be mounted to said firearm, said base having one or more fastener bores and having a pair of generally upwardly projecting walls which define a trough,

one or more elongated fasteners installed within said fastener bore for attaching said base to said firearm,

a floating block slidable within said base trough and having a slot which receives said fastener thereby permitting relative movement thereto, said block further having a blind bore extending in the direction of sliding movement of said floating block in said base,

a coil spring member installed in said blind bore such that one end of said spring is coupled to said floating block and another end of said spring engages said fastener, thereby biasing said floating block away from said fastener,

a stem support pivotably engaging said base walls and disposed in said trough such that said floating block is urged into contact with said stem support, said stem support having a pair of adjacent substantially flat surfaces such that as said stem is biased to remain in the rest and operational positions, said stem support having a first elongated channel,

a windage and elevation stem member engaging said stem support elongated channel and defining a second elongated channel extending in a direction perpendicular to said first elongated channel, and

a sight member slidably engaged by said windage and elevation stem member second elongated channel.

4,525,933

ADJUSTABLE T-SQUARE

Richard M. Patterson, P.O. Box 567, Hendersonville, N.C. 28793

Filed Apr. 11, 1983, Ser. No. 483,736

Int. Cl.[3] B43L 7/06

U.S. Cl. 33—470 5 Claims

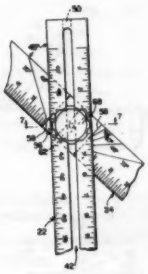
1. An adjustable T-square, comprising:

an elongated blade having a longitudinal axis, top and bottom surfaces, side walls, linear measurement indicia on said top surface and an elongated through slot extending along said blade longitudinal axis, said top and bottom surfaces and said side walls substantially defining a rectangle in transverse cross section;

an elongated cross member having a longitudinal axis, top and bottom surfaces, linear and angle measurement indicia on said top surface and a notch in said top surface, said notch having two opposed substantially planar side surfaces, said side surfaces being spaced apart approximately the distance between said blade side walls, said notch receiving said blade for orienting said longitudinal axes perpendicularly, preventing relative angular movement and permitting said cross member to slide along said blade

longitudinal axis, said blade being removable from said notch by a separating relative movement of said blade and cross member in a direction perpendicular to said longitudinal axes for permitting angular adjustment therebetween;

a land located in said notch between said side surfaces, said land having substantially planar side walls extending generally parallel to said side surfaces, said land and slot having substantially equal widths, said land being receivable in said slot;



a threaded member coupled to said cross member in said notch and extending perpendicularly from said cross member top surface through said blade slot; and

a knob coupled to said threaded member and movable relative to said blade and cross member for forcing said blade against said cross member such that relative longitudinal and angular positions of said blade member and cross member can be adjusted and secured without complete disengagement of said blade, said cross member, said threaded member and said knob.

4,525,934

METHOD AND APPARATUS FOR DRYING MOISTURE-LADEN POWDER-LIKE PRODUCTS, PARTICULARLY OF STARCHES AND FLOURS

Dieter Hess, Kernen, and Helmut Langenbacher, Stuttgart, both of Fed. Rep. of Germany, assignors to Werner & Pfleiderer, Stuttgart-Feuerbach, Fed. Rep. of Germany

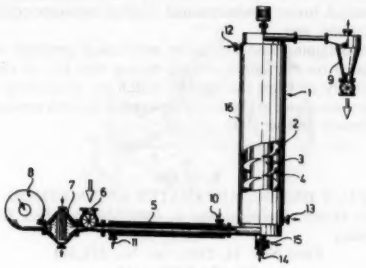
Continuation of Ser. No. 328,821, Dec. 9, 1981, abandoned. This application May 2, 1984, Ser. No. 606,370

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046851

Int. Cl.³ F26B *3/10*

U.S. Cl. 34—10 **12 Claims**

1. In a method for drying a moisture-laden powder-like product wherein the product is carried by a conveying gas through a rotary tube dryer having in its interior helical guide members extending from a central tube to define a helical path, the improvement comprising supplying a feeding gas stream, heating the supplied gas stream, directly feeding a stream of the moisture-laden powder-like product into the heated feeding gas stream, feeding the mixture of powder-like product and heated gas stream into a length of smooth, unobstructed tubing and guiding the formed mixture through the free cross-section of said tubing along the length thereof, heating said tubing to



heat said mixture flowing therein whereby part of the moisture on the surface of the powder-like product is convectively removed and thereafter feeding said mixture tangentially into the rotary tube dryer whereby another part of the moisture of the product is removed.

4,525,935

METHOD FOR DEWATERING ITEMS OF WASHED LAUNDRY

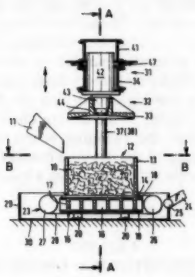
Günter Stühmeier, Löhne, and Karl Holzinger, Bad Oeynhausen, both of Fed. Rep. of Germany, assignors to Herbert Kannegiesser GmbH & Co., Vlotho, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 401,280, Jul. 23, 1982, abandoned. This application Nov. 9, 1982, Ser. No. 440,476

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131093

Int. Cl.³ F26B *5/14*

U.S. Cl. 34—14 **9 Claims**



1. A process for dewatering batches of washed laundry, comprising the steps of:

(a) loading a batch of washed and wet laundry into an open-ended cylindrical container (**12**) disposed on a fluid permeable support plate (**14**),

(b) lowering a rigid circular platen (**33**) dimensioned to fit closely within said container into said container at a relatively high speed until 50% of a maximum mechanical pressure on the laundry is reached to mechanically compress the laundry batch and squeeze water out through the support plate,

(c) continuing to lower the platen at a relatively slower, creep speed into the container to further compress the laundry batch and squeeze additional water out through the support plate until said maximum pressure is reached,

whereat a first predetermined residual moisture content is reached,

(d) establishing a pressurized air flow in through the platen into the container, down through the laundry batch and out through the support plate to further dewater the laundry batch for a predetermined period of time, whereat a second, lower predetermined residual moisture content is reached, and

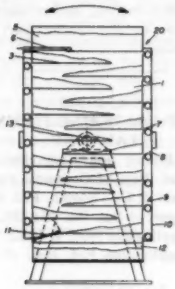
(e) maintaining said maximum mechanical pressure of the platen on the laundry batch during step (d), to thereby initially dewater the laundry batch by mechanical pressure alone and to thereafter dewater it by both mechanical pressure and air flow.

4,525,936

FLUX DRYING APPARATUS AND METHOD

Günther Hauck, Ludwigstrasse 2, 4400 Munster, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,341
Int. Cl.³ F26B *3/14*
U.S. Cl. 34—33 **23 Claims**



22. A method of drying welding flux comprising feeding flux to be dried downwardly by gravity onto an uppermost one of a vertically staggered, interleaved array of shelf plate support members within a drying chamber; swinging the drying chamber about an axis generally parallel to the members while feeding flux downwardly by gravity from one to another of the members and while heating and drying the flux; periodically interrupting the swinging of the drying chamber; heating and drying the flux while the swinging is interrupted; and then resuming the swinging of the drying chamber; and feeding the dried flux downwardly by gravity from a lowermost one of the members.

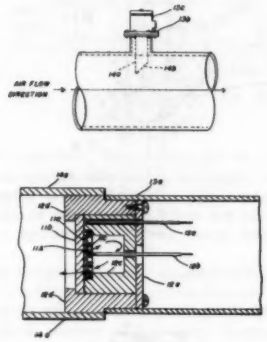
4,525,937

MOISTURE MONITORING DRYER CONTROL APPARATUS

Charles F. Strandberg, Jr., High Point, and Robert C. Strandberg, Greensboro, both of N.C., assignors to Strandberg Engineering Laboratories, Inc., Greensboro, N.C.

Filed Apr. 27, 1984, Ser. No. 604,980
Int. Cl.³ F26B *21/10*
U.S. Cl. 34—48 **14 Claims**

1. A moisture monitoring dryer control apparatus for a dryer of goods having electrically operated motor means and heater means and an exhaust duct through which air from the dryer passes whose humidity level signifies the residual moisture in the goods being dried, the apparatus comprising a moisture sensor assembly to be installed in the dryer air exhaust duct for sensing the humidity of the air exhausting therethrough and a dryer control and display unit electrically connected to the sensor to receive electrical signals therefrom, the moisture sensor being a resistance type includes a head portion housing a thin piece of hygroscopic material of predetermined small area having front and back faces and sandwiched between a front porous filter member and a perforated backing plate in substantially coextensive relation in close physical contact with the front and back faces of said piece of hygroscopic material over the whole area thereof, a pair of electrical conductors connected respectively to said filter member and said backing plate and to electrical circuitry in said control and display unit, a high resistance air sample cup member engaging and extending rearwardly from said filter member forming a



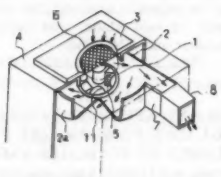
substantially closed chamber rearwardly of said perforated plate into which air can enter through the porous filter but must return therethrough, an elongated extension tube member having said head portion of the sensor carried on an end thereof to be supported by the tube member in an air sensing position in said exhaust duct with the longitudinal axis of the tube member arranged perpendicular to the direction of air flow through the duct and perpendicular to the sandwiched hygroscopic material piece, backing plate and filter member.

4,525,938

SPIN DRIER FOR SEMICONDUCTOR MATERIAL

Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Jan. 9, 1984, Ser. No. 569,455
Int. Cl.³ F26B *17/32*
U.S. Cl. 34—58 **9 Claims**



1. A spin drier for semiconductor material comprising:

(A) a generally circular casing defining a chamber having an axial gas inlet and a radial gas outlet;

(B) a rotor disposed in said chamber, said rotor having a bottom wall;

(C) at least one, but no more than two, semiconductor carrier holder mounted on said rotor at the periphery thereof; and

(D) at least three inwardly-facing elongated convexly curved guide members essentially vertically disposed along the periphery of said rotor and mounted thereon;

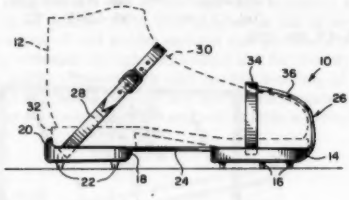
(E) said holder being positioned between two guide members.

4,525,939

BOOT SAFETY ATTACHMENT

Reginald K. McNeil, and George Spector, both of 233 Broadway, RM 3615, New York, N.Y. 10007

Filed Oct. 24, 1983, Ser. No. 544,844
Int. Cl.³ A43B 5/00
U.S. Cl. 36—7.6 3 Claims



1. A non-slipping attachment for a boot, shoe, sneaker and the like comprising:

(a) a toe portion having a plurality of downwardly disposed fround gripping spikes;

(b) a heel portion having an upstanding rear heel engaging flange and a plurality of downwardly disposed ground gripping spikes;

(c) a resiliently stretchable center bridge secured between the toe portion and the heel portion;

(d) a flexible toe surrounding member attached to the toe portion; and

(e) an adjustable strap attached to the heel portion and across an instep for detachably securing the upstanding rear heel engaging flange to rear of a heel of the boot, shoe, sneaker and the like, wherein the flexible toe surrounding member comprises:

(a) a vamp ring strap member having a first pair of outwardly disposed spikes of one size and a second pair of outwardly disposed spikes of another size opposite the first pair of outwardly disposed spikes; and

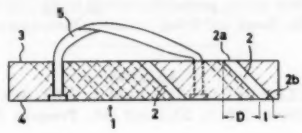
(b) a tip strap member having one side attached to the toe portion while the other side contains a detachable loop portion attached to the vamp ring strap member so that when the detachable loop portion is opened the vamp ring strap member can be turned transversely around the toe portion whereby the spikes can be changed for raising and lowering the toe portion.

4,525,940

BEACH SANDALS

Hideto Mochizuki, 4-61 Uwamachi, Yokusuka-shi, Kanagawa-ken, Japan

Filed Apr. 5, 1983, Ser. No. 482,140
Claims priority, application Japan, Sep. 19, 1982, 57-141533[U]; Sep. 19, 1982, 57-141534[U]
Int. Cl.³ A43B 5/08
U.S. Cl. 36—8.1 10 Claims



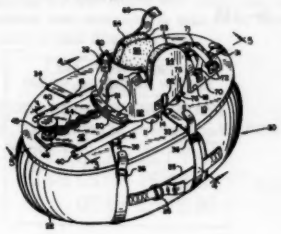
1. A beach sandal which is comprised of a sole having a foot retaining means and further including a plurality of non-perpendicular through-holes arranged throughout the surface of the sole forming openings in the upper and lower surfaces thereof.

4,525,941

MUD WALKER

George F. Ruth, Jr., 101 Haussler Rd., Kelso, Wash. 98626

Filed Jan. 20, 1984, Ser. No. 572,536
Int. Cl.³ A43B 5/04
U.S. Cl. 36—116 10 Claims



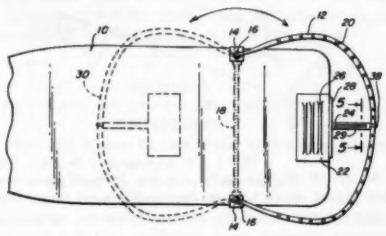
1. A mud walker comprising a platform, an elliptical flexible compressed air tube supporting only marginal portions of said platform, an air connection for inflating said tube with compressed air, a flexible and inelastic protective covering on said compressed air tube, means securing said compressed air tube and covering to said marginal portions of the underside of said platform leaving an open space under the center of the platform, air vent holes in said central portion of said platform spaced away from said compressed air tube and communicating with said open space under the platform, baffles spaced above said air vent holes, and means on the upper side of said platform for attachment to the foot of a wearer.

4,525,942

IRONING BOARD ATTACHMENT

Frank Azzara, 116 Riegelman St., Staten Island, N.Y. 11303

Filed Jan. 6, 1984, Ser. No. 568,750
Int. Cl.³ D06F 79/00
U.S. Cl. 38—106 5 Claims



1. A support rail in combination with an ironing board comprising means for pivotally attaching said rail to the substantially perpendicular edges of the ironing board sides to extend across said board so that the rail can be swung from a storage position to a support position substantially parallel to the surface of the ironing board, a brace pivotally attached at a first end to an intermediate portion of said rail, and an iron support stand pivotally attached to a second end of said brace wherein when said rail is in said support position said stand is located between an ironing board end edge and said rail intermediate portion such that an iron support surface on said stand is flush with said ironing board surface and an end surface on said stand which is substantially perpendicular to said iron support surface is flush with said ironing board end edge.

4,525,943

MOVABLE CALENDER MARKER

Shuji Iwata, 68-2, 3-chome, Shimoishihara, Chofu 182, Japan

Filed Sep. 9, 1983, Ser. No. 530,641

Claims priority, application Japan, Sep. 21, 1982, 57-141861[U]

Int. Cl.³ G09D *3/00*

U.S. Cl. 40—110 **8 Claims**

1. A movable calendar marker comprising:

a frame member having a window therein; and

means for fixing said frame member to a calendar sheet, said fixing means being provided at one side of said frame member and having a recess therein, said recess having a small diameter section formed in an outer side thereof and a large diameter section formed in an inner side thereof, said recess containing a manually deformable sticky plastic material, a portion of said sticky plastic material projecting from said recess.

4,525,944

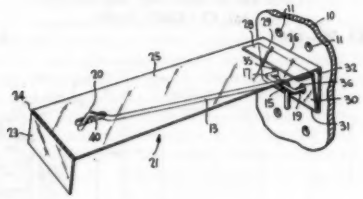
PRODUCT IDENTIFICATION TAG

Jacob J. Fast, 7561 NW. 9th St., Plantation, Fla. 33317

Continuation-in-part of Ser. No. 473,650, Mar. 9, 1983. This application Aug. 2, 1983, Ser. No. 519,226

Int. Cl.³ G09F *1/00*

U.S. Cl. 40—124.1 **19 Claims**



1. An article of manufacture in the form of an elongated flexible plastic sheet having first and second ends, display, intermediate and mounting portions disposed at successive longitudinal locations along said sheet, and first and second transversely-extending fold lines impressed into said sheet and extending transversely across the entire sheet, wherein said display portion includes said first end and is separated from said intermediate portion by said first fold line, wherein said mounting portion includes said second end and is separated from said intermediate portion by said second fold line, wherein said intermediate portion is substantially longer than each of said display and the mounting portions, and wherein said mounting portion has a plurality of die-out transversely-spaced apertures defined therein wherein said mounting portion includes a flap section located at said second end of said sheet, a middle section separated from said flap section by a third transversely-extending fold line impressed into said sheet and extending transversely across the entire sheet, and an inboard section separated from said middle section by a fourth transversely-extending fold line and pressed into said sheet and from said intermediate portion of said sheet by said second fold line.

4,525,945

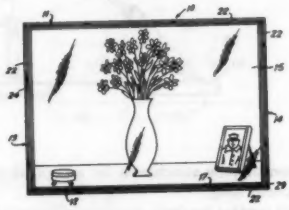
GALLERY FRAME

Julius Shultz, Yonkers, N.Y., assignor to Dax Manufacturers Inc., Yonkers, N.Y.

Filed Jan. 5, 1984, Ser. No. 568,600

Int. Cl.³ A47G *1/06*; G09F *1/12*

U.S. Cl. 40—152 **4 Claims**



1. A unit for displaying artwork comprising

(a) four mitered molding sections connected to form a rectangular frame;

(b) each of said molding sections formed of clear acrylic material and having a solid cross-sectional configuration defining a planar outer side wall, a planar front wall and a planar rear wall generally perpendicular to said side wall, a planar inner side wall, and independent lip, retaining, and assembly flanges projecting inwardly from said inner side wall;

(c) at least one of said side walls of said molding sections is frosted;

(d) said lip flange is co-planar with said front wall;

(e) said assembly flange is spaced from said rear wall;

(f) said retaining flange being disposed between said lip and assembly flanges;

(g) said retaining flange and said assembly flange defining a hardware groove adapted to receive frame-hanging means;

(h) said retaining flange including a recessed portion terminating in an abutment shoulder spaced inwardly of said inner side wall;

(i) corner joining means associated with consecutive end portions of said assembly flanges;

(j) said corner joining means comprising spaced pairs of generally L-shaped connecting plates, each of which pairs of plates straddles said assembly flange;

(k) screw means fastening said plates to one another and rigidly clamping said assembly flange therebetween;

(l) said front and rear walls being polished, whereby said sections are tranparent from said front to said rear walls;

(m) a plurality of biasing springs are being disposed along said abutment shoulder for urging artwork forwardly of said retaining flange toward said lip flange; and

(n) a clear planar protecting means being disposed against said lip flange and being resiliently biased by said springs.

4,525,946

ROLLER APPARATUS FOR A FLEXIBLE WEB

Carl G. Olson, 705 N. Elmhurst Rd., Prospect Heights, Ill. 60070

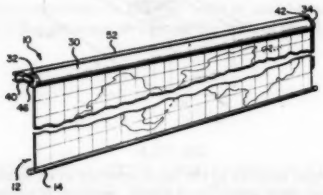
Filed May 11, 1981, Ser. No. 262,529

Int. Cl.³ G09F *11/30*

U.S. Cl. 40—514 **5 Claims**

1. A roller apparatus for a flexible web such as a chart, said flexible web being provided on at least one free margin thereof with a rigid, elongated holder element of predetermined cross-sectional dimensions which are substantially greater than the

thickness of said flexible webbing material, said roller apparatus comprising: rigid, elongated tubular roll means of substantially greater dimensions than said predetermined cross-sectional dimensions of said holder element and including a longitudinal through slot of a cross-sectional dimension smaller than those of said holder element and greater than the thickness of said web, a pair of end caps with one attached to either end of said tubular roll means for rotation therewith and presenting a radial friction drag surface, one of said end caps including a through opening of dimensions at least as great as the cross-sectional dimensions of said holder element and peripherally communicating with said through longitudinal slot for slidably receiving said holder element with said flexible webbing affixed thereto and depending through and below said longitudinal slot, whereby said holder element and said flexible webbing



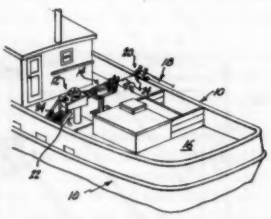
depending therefrom are slidably insertable into the tubular roll means selectively from either right-hand or left-hand margins of said flexible webbing so as to selectively reveal either surface of said flexible webbing with respect to a fixed observer, each end cap having centered shaft means; a pair of bracket means receiving said shaft means of adjacent end caps for rotatably mounting said roll means with said brackets for rotation in either direction, whereby said flexible webbing may be rolled upon said roll means in either clockwise or counterclockwise direction; adjustable drag means mounted to an adjacent bracket means for imparting a selectable amount of drag on the friction drag surface of the adjacent one of said end caps during rotation of said roll and bi-directional drive means for selectively rotating said roll means relative to said bracket means to effect rolling of the flexible webbing material in either direction upon said roll means.

4,525,947

METHOD AND APPARATUS FOR UNWRAPPING A PLURALITY OF SHORT LINES FROM A LONGLINE

Donn B. Furlong, Snohomish, Wash., assignor to Marine Construction & Design Co., Seattle, Wash.

Filed Jun. 11, 1984, Ser. No. 619,204
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—4 **12 Claims**



1. A method for unwinding a plurality of short lines from a longline, said short lines being affixed to and spaced along said longline, one end of said short lines being fixed to said longline, the other end of said short lines being free from said longline, the method comprising the steps of:

forwarding said longline along a relatively straight, unwinding path past a wrapping station and an upwrapping station, said unwrapping station being downstream from said wrapping station,

controllably grasping the free end of a short line as it passes said wrapping station and wrapping said short line in a first direction about said long line regardless of the initial wrap orientation of the short line about said long line, and

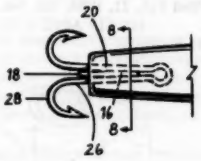
controllably grasping the free end of said short line at said unwrapping station and unwrapping said short line in a direction opposite to said first direction.

4,525,948

FISHING LURE ARRANGEMENT

William Huntington, SR Box 80123, Fairbanks, Ak. 99701

Filed Jul. 25, 1983, Ser. No. 516,975
Int. Cl.³ A01K *85/02*
U.S. Cl. 43—42.04 **5 Claims**



1. In a fishing lure

a lure body,

multi-gang hooks including multi-stems, each stem extending to a respective hook,

said multi-stems terminating in a single eyelet,

abutment means on the lure body and being embraced by said multi-stems so that limited relative longitudinal movement between hooks and the lure body is accomdated,

at least some of said multi-stems frictionally and continuously engaging said abutment means during said relative longitudinal movement thereby providing continuous frictional resistance to said movement,

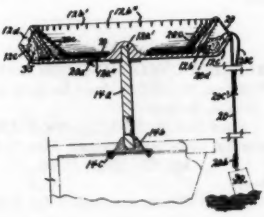
said eyelet being adapted to engage said abutment means and thereby halt said relative longitudinal movement between the hooks and the lure body, a cavity in the lure body, channel means from the outer surface of the lure and communicating with the cavity, and said channel means being adapted to telescopically receive said stems.

4,525,949

TROTLINE STORING AND DISPENSING ARRANGEMENT

Jesse L. Pike, Rte. 3, Box 18, and Bobby D. Jennings, Uniontown Rd., both of Morganfield, Ky. 42437

Filed Nov. 21, 1983, Ser. No. 553,574
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—57.3 **6 Claims**



1. A trotline storing and dispensing arrangement comprising a receiving receptacle having a horizontal bottom wall, said bottom wall being bifurcated to form outwardly angling

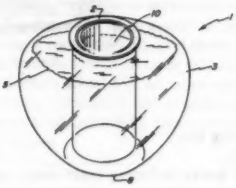
spaced-apart first and second side walls, means mounting said receiving receptacle for rotatable movement with respect to a supporting surface, a series of partitions radially positioned between said first wall and said second wall of said receiving receptacle to define storage compartments, said first wall including a rim having a series of spaced-apart notches therealong, and a trotline disposed within said receiving receptacle including leaders secured thereto and respectively extending through each of said notches into one of said storage compartments, where said leaders each retain a bait receiving hook, where said trotline has ends, and where said second wall has an upper rim lower than said rim of said first wall serving a non-entangling relationship between said trotline and said leaders.

4,525,950

RECEPTACLE FOR ARTICLES OR THE LIKE

Donald Glassman, 4601 N. Federal Hwy., Pompano Beach, Fla. 33064

Filed Feb. 21, 1984, Ser. No. 581,967
Int. Cl.³ A01G *5/00*
U.S. Cl. 47—41 R **8 Claims**



1. A receptacle system adaptable to present the illusion of being completely filled to a generally horizontal liquid level, said receptacle system comprising:

a first receptacle means, said first receptacle means being generally hollow and comprising an opening having a rim, said first receptacle means being of substantially transparent material;

a second receptacle means located within said first receptacle means, said second receptacle means being generally hollow, of generally tubular shape, and disposed within said opening of said first receptacle means, said second receptacle means comprising an opening having a rim, said rim of said second receptacle means being disposed to overlie said rim of said first receptacle means so as to be mechanically supported by said rim of said first receptacle means, said second receptacle means being of substantially transparent material;

said rim of said first and said second receptacle means each being sized and shaped so that said rims together form a seal; and

a cavity means disposed between the inner surface of said first receptacle means and the outer surface of said second receptacle means, said cavity being hermetically sealed by said seal.

4,525,951

BARRIER UNLOCKING MECHANISM

Joseph E. Williams, Shankill, Ireland, assignor to Coras Iompair Eireann, Dublin, Ireland

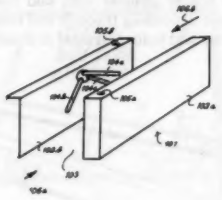
Filed Mar. 4, 1983, Ser. No. 472,031
Claims priority, application Ireland, Mar. 5, 1982, 496/82
Int. Cl.³ E06B *11/08*
U.S. Cl. 49—47 **18 Claims**

1. A locking and release mechanism for a barrier of a gate having at least one stop member associated with the barrier, said mechanism comprising:

(a) a body portion of the mechanism having a fixed latch-abutment portion,

(b) a locking member having a movable latch-abutment portion and being displaceable relative to said body portion between a locking position in which the locking member engages the stop member to prevent displacement of the barrier and a release position in which the barrier may be displaced,

(c) latch means for retaining the locking member in its locking position, the latch means having a latch member displaceable between a latching position in which it engages between said fixed and movable latch-abutment portions and an unlatched position in which it is disengaged from said fixed abutment portion, said abutment portions being



disposed relative to the latch member in its latching position so that when the locking member is in its locking position and a force is applied to it urging it towards its release position, said abutment portions apply forces to the latch member urging it towards its unlatched position, and

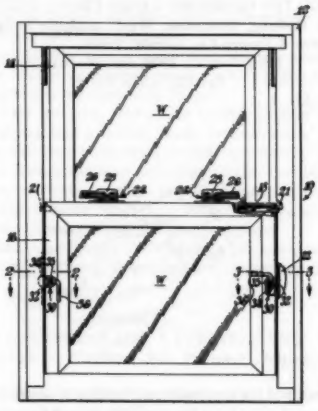
(d) latch holding and release means having a latch release member displaceable between a latch retaining position in which it maintains the latch member in its latching position and a releasing position in which the latch member may be displaced from its latching position towards its unlatched position.

4,525,952

WINDOW LOCKING ARRANGEMENT

Philip J. Cunningham, Newark, and Leon F. Slocomb, Jr., Wilmington, both of Del., assignors to Slocomb Industries, Inc., Wilmington, Del.

Filed Sep. 6, 1983, Ser. No. 529,267
Int. Cl.³ E05D *13/04*
U.S. Cl. 49—449 **6 Claims**



1. In a window arrangement of the type having a pair of sashes to which the window panes are mounted with the sashes being vertically slidable to selectively control the amount of window opening, locking means being provided for locking

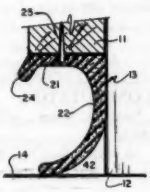
juxtaposed edges of the sashes to each other, the sashes being formed from hollow members and being mounted to a hollow frame in such a manner that each sash may pivot inwardly to facilitate cleaning of the window, the improvement being a locking member being provided on each side on one of said sashes, at least one slot being formed in each side of said hollow frame corresponding in size and position to a respective locking member, means for mounting each locking member for selective engagement in a respective slot to thereby m maintain a seal of the sash, said locking means comprising a pair of locking mechanisms for locking said lower sash to said upper sash, housing being mounted in each of said slots into which said locking member may be selectively moved, securing means securing said housing in its respective slot, said securing means including flange means at the open face of said housing, and wedge members on the end walls of said housing spaced from said flange means to capture the wall of the slot therebetween.

4,525,953

WEATHER SEAL WITH WIDE RANGE OF FLEXURE

Ellis D. Stutzman, 8070 Meade St., Westminster, Colo. 80030

Filed Oct. 14, 1983, Ser. No. 542,008
Int. Cl.³ E06B 7/16
U.S. Cl. 49—488 **7 Claims**



1. A weather seal for the bottom of an overhead garage door having an uneven gap between the door and the floor surface comprising a one-piece unitary body of a resilient weather-resistant material that is an extruded, closed cell structure with a skin surface that will not harden during cold weather conditions, said body extending the full length of the door and including:

a base section secured to and extending under an edge surface of a door substantially the full front to rear extent thereof;

a resilient arm section extending down from and substantially normal to a forward end portion of said base section; and

a downwardly and rearwardly inclined end section extending from said arm section disposed opposite and in spaced relation to said base section at an acute inside angle of less than 45° to said base section,

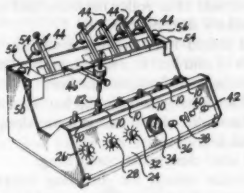
said arm section being flexed as the door is closed to resiliently urge said end section against the stationary surface, the length of said arm section being approximately the same as the length of said base section and the combined length of said arm and end sections being approximately twice the length of said base section to provide a wide range of flexure and provide a substantially constant loading of a sealing surface in contact with the stationary surface throughout the extent of the door edge surface, said arm section being movable from an unflexed position substantially normal to said base section to a fully flexed position substantially parallel to said end section along a wide range of gap dimensions.

4,525,954

DRIVE MECHANISM FOR A LAPPING MACHINE OR THE LIKE

Erik A. Larsen, 2516 14th Ave. West, Suite 303, Seattle, Wash. 98119

Filed Sep. 15, 1983, Ser. No. 533,133
Int. Cl.³ B24B 5/16
U.S. Cl. 51—58 **25 Claims**



1. A lens polishing machine, comprising:

a rotating member having a workpiece engaging end;

an oscillating member having a workpiece engaging end, wherein in use a workpiece is secured to one of the members and the other carries a polishing or grinding compound;

means for oscillating said oscillating member including:

an endwise reciprocating drive rod to which said oscillating member is connected, which when reciprocated, causes the oscillating member to oscillate;

a drive lever extending at an angle to said drive rod having a first end pivotally connected to the drive rod and a second end pivotally mounted in a manner permitting the drive lever to swing back and forth about said second end, within the plane of movement of the drive rod; and

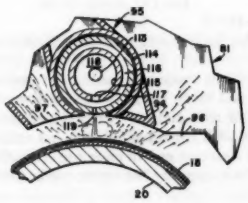
drive means for swinging the drive lever back and forth, including power push means contacting the drive lever and operable to swing the drive lever in one direction through a drive stroke, and spring means for returning the drive lever in the opposite direction through a return stroke.

4,525,955

ABRASIVE BELT CLEANING SYSTEM

LeRoy E. Cothrell, Cottage Grove, Oreg., and Raymond G. Fair, Osseo, Minn., assignors to Timesavers, Inc., Minneapolis, Minn.

Continuation of Ser. No. 313,344, Oct. 20, 1981, abandoned, which is a continuation of Ser. No. 236,883, Feb. 23, 1981, abandoned, which is a continuation of Ser. No. 80,137, Sep. 28, 1979, abandoned, which is a continuation of Ser. No. 872,369, Jan. 26, 1978, abandoned. This application Jan. 20, 1984, Ser. No. 572,467
Int. Cl.³ B24B 21/12, 53/10
U.S. Cl. 51—135 R **1 Claim**



1. Dry abrading apparatus comprising, in combination:

(a) means moving a flexible endless abrasive belt in a closed orbital path around a contact roller and an idler roller spaced therefrom for abrading engagement with a work-

piece generally along a first contact line at the periphery of said contact roller and extending generally laterally between the ends thereof, said belt having a first portion moving away from said contact roller and a second portion moving toward said contact roller;

(b) belt shrouding means comprising an infeed dust hood extending adjacent said first belt portion, a secondary dust pickup extending adjacent said second belt portion, and an idler dust hood adjacent to and extending around a portion of said idler roller between said infeed hood and said secondary dust pickup;

(c) said infeed hood having a suction inlet extending the width of said belt at a site along the belt path immediately following said first contact line;

(d) said secondary dust pickup having a suction inlet extending the width of said belt at a site along the belt path prior to said first contact line;

(e) said idler dust hood comprising:

(1) nozzle means for directing laterally spaced jets of gaseous fluid generally normal to and against the surface of said belt in a direction radially inwardly of said idler roller and along a second contact line extending generally laterally of said belt as the belt passes around said idler roller, said second contact line being disposed substantially midway of the arcuate contact wrap of said belt with said idler roller; and

(2) a suction inlet in immediate apposition with the portion of said idler roller between said infeed hood and said secondary dust pickup, and extending in both arcuate directions from said second contact line, and laterally enveloping said second contact line and extending along and shrouding said belt in both said first and second belt portions;

(f) suction means connected to said infeed hood, said secondary dust pickup, and said idler hood;

(g) means for cyclically supplying gaseous fluid to said nozzle means for finite repeated time periods, with periods of supply of gaseous fluid being interrupted by finite time periods of quiescence, to periodically dislodge from said belt particles embedded thereon; so that particles released from said belt at said contact roller are received in said infeed hood, and particles released from said belt at said idler roller are received in said idler hood; and

(h) air foil means disposed within said idler dust hood and encompassing said nozzle means and tapered in a direction extending toward the approaching belt, to reduce the turbulence of gas accompanying the belt and approaching said idler dust hood.

4,525,956

IN-SITU ANNULAR FACE GRINDER

Billy D. Sears, Waipahu, Hi.; Gerald G. Holland, Fairbanks, Ak.; John R. Cazinha, and Donovan J. Reames, both of Kaneohe, Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 9, 1984, Ser. No. 597,966
Int. Cl.³ B24B *19/26*
U.S. Cl. 51—241 S **9 Claims**

1. A machine for grinding the top surface of an annular body comprising:

a block which is receivable within the annulus of the body; the top of said block having a central hole;

a plurality of rods slidably extending transversely through the block with a first end of each rod extendable into said hole and a second end of each rod extendable from a side of the block opposite the inside surface of the annulus of said body;

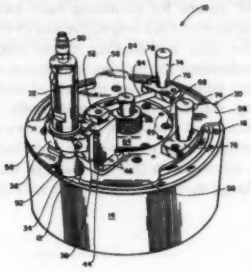
a plurality of arcuate pads, each pad having an arc which conforms to the inside curve of the body annulus and being mounted to a respective second end of each rod;

a bolt threaded into the central hole of the block, said bolt having a bottom tapered portion for engaging the first ends of the rods so that when the bolt is threaded into the block the rods will be forced outwardly to engage the arcuate pads with the inside annular surface of the body;

a turntable;

means slidably mounting the turntable on top of the block;

the turntable having radial extensions for engaging the top surface of the annular body so that the block can be accurately centered before the pads are brought into engagement with the inside annular surface of the body;



grinding means mounted on the turntable and having a downwardly facing grinding surface for engaging the top surface of the body; and

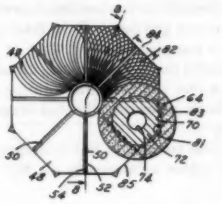
means for moving the grinding surface toward and away from the top surface of the body.

4,525,957

APPARATUS AND METHOD FOR FINISHING RADIAL COMMUTATOR

Robert L. Daniels, W. Newton, Mass., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 16, 1984, Ser. No. 590,242
Int. Cl.³ B24B *19/00*
U.S. Cl. 51—244 **4 Claims**



1. Apparatus for grinding a face type commutator having a plurality of soft metal electrically conductive commutator segments with radially extending faces each of the segments being separated by slots comprising,

rotatable drive spindle means for mounting the commutator to locate the radially extending faces thereon in a first plane perpendicular to a first axis of rotation of said drive spindle means;

a rotatable grinder head means and an abrasive cylinder rotatably driven by said grinder head means on a second axis of rotation offset from said first axis of rotation;

said abrasive cylinder having a flat end positioned by said grinder head means in a plane perpendicular to both of said first and second axes and parallel to said first plane;

means for concurrently rotating the commutator and the abrasive cylinder on said first and second axes of rotation;

and pressure limiting means for controlling abrasion between the flat end of said abrasive cylinder and the flat faces of the commutator assembly to produce a cycloidal tool mark

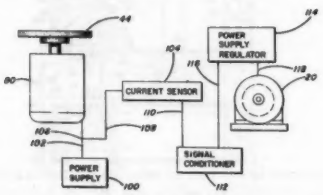
pattern with a uniform surface roughness through the full planar extent of the commutator face.

4,525,958

METHOD OF CONTROLLING ARTICLE SPEED DURING EDGE GRINDING

George W. Reissig, Sarver, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 322,786, Nov. 19, 1981, abandoned. This application Feb. 21, 1984, Ser. No. 581,744
Int. Cl.[3] B24B *9/10*
U.S. Cl. 51—283 E 3 Claims



1. A method of shaping peripheral edge portions of a glass sheet to provide a sheet having a non circular peripheral configuration, comprising the steps of:

rotating the glass sheet about a sheet axis of rotation;

rotating shaping means about a shaping axis of rotation;

measuring current input to the shaping means;

biaising peripheral edge portions of the sheet and shaping means toward one another to shape peripheral edge portions of the sheet to provide the sheet with the non-circular peripheral configuration, wherein the peripheral speed of the sheet as it moves past the shaping means (1) increases as the spaced distance between the sheet axis of rotation and shaping axis of rotation increases, resulting in an increase in the measured current input to the shaping means, and (2) decreases as the spaced distance between the sheet axis of rotation and shaping axis of rotation decreases, resulting in a decrease in the measured current input to the shaping means;

monitoring the measured current input; and

altering rotational speed of the glass sheet as a function of said monitoring step, wherein the rotational speed of the sheet is decreased to decrease the peripheral speed of the sheet in response to the increase in the measured current input, and the rotational speed of the sheet is increased to increase the peripheral speed of the sheet in response to the decrease in the measured current input.

4,525,959

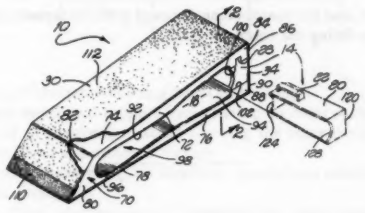
ABRASIVE FINISHING TOOL

Warren S. Ziebarth, 15131 Triton La., 114, Huntington Beach, Calif. 92649, and Janet E. Cater, 909 Electric Ave., Seal Beach, Calif. 90740

Continuation-in-part of Ser. No. 267,135, May 26, 1981, abandoned. This application Jan. 21, 1983, Ser. No. 459,918
Int. Cl.[3] B24D *15/02*
U.S. Cl. 51—391 24 Claims

1. A hand finishing tool for use with a continuous abrasive belt comprising:

a unitary forked member having a length and a width in a transverse direction to the length and having a lengthwise first leg with a planar first outside surface, a lengthwise second leg with a planar second outside surface and a connecting surface connecting the first and second outside surfaces to define a wedge shaped front end with a knife-like transverse edge at the junction between the connecting surface and the second outside surface, the first leg terminating at a first rear edge region having a planar outside first rear edge surface angled from the first outside surface, the second leg terminating at a second rear edge region having a planar outside second rear edge surface angled from the second outside surface, the first and second rear edge surfaces being remote from the front end of the finishing tool, the forked member further having an inside surface defining a first inside surface region extending from the first rear edge region along the first leg, a second inside surface extending from the second rear edge region along the second leg in generally facing relationship to the first inside surface, and a U-shaped inside connecting surface region between the first and second inside surface regions adjacent the front end of the finishing tool, the inside surface bounding an open sided channel cavity extending across the width of the forked member, the first and second legs of the forked member between the first and second legs, being resiliently flexuous to alter the spacing between the first and second legs along their lengths, the first inside surface region having a first



slide surface at the first rear edge region and the second inside surface region having a second slide surface at the second rear edge region, the first and second slide surfaces extending across the width of the forked member in spaced apart, aligned relationship to each other, at least one of the first and second slide surfaces tapering toward the other of the first and second slide surfaces in the direction of the forked member width the belt being insertable around the unitary forked member along the direction of the length thereof; and

a wedge member for being inserted in the direction of the width of the forked member into the region between the first and second slide surface to wedge apart the first and second legs and effect tightening of the abrasive belt on the finishing tool, the cavity between the first and second legs remaining accessible from the sides of the forked member for gripping the finishing tool.

4,525,960

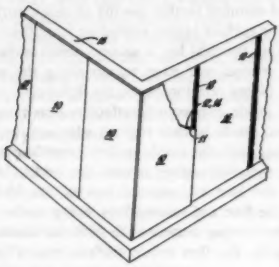
BASEMENT WALL INSULATING AND WATERPROOFING SYSTEM AND METHOD

Josh Kelman, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 30, 1984, Ser. No. 575,364
Int. Cl.[3] E02D *19/16*
U.S. Cl. 52—169.14 2 Claims

1. An insulating and waterproofing system for a basement wall, the system comprising asphalt sealing compound on the exterior of the basement wall, only partially covering the wall, and being present in vertical stripes spaced apart by approximately the width of an insulating board, and a plurality of the insulating boards installed on the exterior of the wall in abutting relationship to each other, joints between pairs of adjacent boards being located respectively at the vertical stripes of

asphalt sealing compound, each insulating board comprising a glass fiber board coated on one side with asphalt and kraft



paper, and the boards being disposed with the asphalt and kraft paper facing the basement wall.

4,525,961

DOUBLE-GLAZED WINDOW FOR INSERTION IN OPENINGS IN WALLS OR DOORS OF A SANDWICH-TYPE CONSTRUCTION

Helge Hansen, Greve Strand, Denmark, assignor to Thermoform A/S, Greve Strand, Denmark

Filed Apr. 26, 1984, Ser. No. 604,102
Int. Cl.³ E06B *3/00*
U.S. Cl. 52—208 **5 Claims**

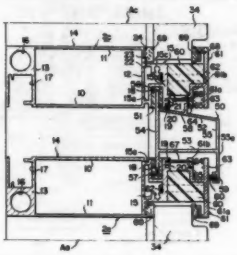
1. A double-glazed window for insertion in openings in walls and doors of sandwich construction having a porous core between panels of harder material, said window comprises two identical glazing elements covering the opening on opposite sides of the sandwich construction and overlapping the panels outside the opening, each glazing element comprising a central integral pane portion with a smooth surface and an edge portion with sealing ribs in engagement with the panels, covering means are disposed within said glazing elements for covering the porous core at a distance from the edge of the core, said covering means comprising two overlapping rib sections that project upright from an inner surface of a corresponding edge portion, each protruding rib being of a height of at least half the thickness of the sandwich construction.

4,525,962

APPARATUS FOR CONNECTING UPPER AND LOWER CURTAIN WALL UNITS IN A UNIT TYPE CURTAIN WALL

Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,193
Claims priority, application Japan, Aug. 2, 1982, 57-133765
Int. Cl.³ E04H *1/00*
U.S. Cl. 52—235 **4 Claims**



1. A connecting device for a pair of upper and lower curtain wall units disposed in an upper and lower positional relation wherein a mounting portion integrally provided on a side wall of a lower horizontal frame member of an upper curtain wall unit and a horizontal batten thereof are fixed opposedly each other in a given spaced relation and wherein a mounting portion integrally provided on a side wall of an upper horizontal frame member of a lower curtain wall unit and a horizontal batten thereof are fixed opposedly each other in a given spaced relation, characterized by comprising a connecting member having an upper portion connected to said lower horizontal frame member and to said horizontal batten thereof and a lower portion connected to said upper horizontal frame member and said horizontal batten thereof, wherein said connecting member comprises an upper wall slightly inclined outwardly and downwardly, inner and outer walls extending substantially vertically downwardly from both edges internally and externally of said upper wall, a lower wall connected between the inner and outer wall, a lower wall connected between the inner and outer walls substantially in the intermediate portion between said inner and outer walls, a protruded hook formed substantially in the intermediate portion of said upper wall to engage the inner side of said horizontal batten of said horizontal member, an upper protruded piece extending vertically upwardly from the inner edge of said upper wall and which is fitted through a resilient retainer into a downwardly directed mounting groove of the mounting portion of said upper curtain wall unit, the lower end of said inner wall vertically displaceably fitted into an upwardly directed mounting groove of the mounting portion of said lower curtain wall unit through a resilient retainer, and the lower end of said outer wall connected to the outer wall surface of said horizontal batten of said lower curtain wall unit through a seal through which air flows.

4,525,963

SECTION FOR MOUNTING A CURTAIN WALL

Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,189
Claims priority, application Japan, Aug. 2, 1982, 57-116166[U]
Int. Cl.³ E04H *1/00*
U.S. Cl. 52—235 **4 Claims**

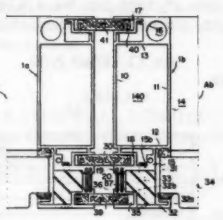
1. A section for mounting a curtain wall on a wall of a building comprising:

a substantially rectangular hollow lengthy section body including as a frame thereof relatively shorter opposed

side walls parallel to the building wall and relatively longer opposed side walls perpendicular to the building wall;

a mounting piece projecting from the one shorter side wall which faces the outside of the building;

at least one longitudinally continuous hollow portion formed at the other shorter side wall facing the inside of the building;



a pair of mounting recesses formed at and arranged in parallel to said shorter side walls, respectively, each opened toward a same one side perpendicular to each of said shorter side walls to be connected to another adjacent section body by a packing band used as a seal member of which one end is inserted into the recess; and

a plurality of other mounting recesses formed at the outer side of said mounting piece, each opened toward the outside of the building.

4,525,964

STRUCTURAL ELEMENT FOR THE MANUFACTURE OF CASINGS, WALL DISKS, BOXES AND SUCH ARTICLES

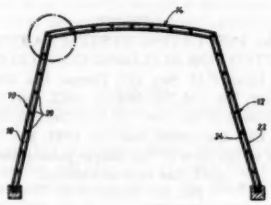
Adolf Diethelm, Reussensteinstrasse 20, D-7312 Kirchheim/-Teck, Fed. Rep. of Germany

Filed May 26, 1983, Ser. No. 498,587

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220176

Int. Cl.³ E04C *1/00*

U.S. Cl. 52—309.11 **13 Claims**



1. A structural element for the manufacture of casings, wall disks, boxes and such articles comprising:

(a) a thin wall shell including;

(i) an inner wall;

(ii) an outer wall spaced from said inner wall, said inner and outer walls tightly joined along their edges so as to form a closed space therebetween;

(iii) said inner and outer walls made of a thermosetting plastic material which is of substantially stable shape and is reinforced so as to render it self-supporting; and

(b) a plurality of structural elements inserted between said inner and outer walls dividing the space between said walls into a plurality of individual cells, whereby the stable shape and reinforcement of said inner and outer walls, in combination with said reinforcement members will provide a stiff structural element of light weight and durability and said sealing of the edges of said inner and outer walls, along with the division into cells will result in a plurality of cells acting as insulators.

4,525,965

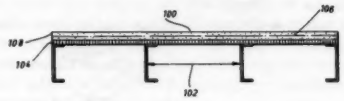
PREFABRICATED BUILDING PANELS

John Woelfel, El Paso, Tex., assignor to Artcraft Panels, Inc., Vinton, Tex.

Filed Feb. 10, 1982, Ser. No. 347,567

Int. Cl.³ E04B *7/00*; E04C *2/26*

U.S. Cl. 52—309.17 **13 Claims**



1. A prefabricated building panel comprising:

a rigid metal stud support frame having an outer surface;

a layer of sheathing material covering the outer surface of the frame and attached thereto;

a wire mesh covering the sheathing material and attached to the frame; and

a modified concrete matrix bonded to the wire mesh, the matrix comprising by weight in its uncured state: 15–20% hydraulic cement, 2–5% water, 1–10% acrylic emulsion, 0.05–0.15% anti-foamer, 0.05–0.15% plasticizer, 40–45% aggregate and 30–35% sand.

4,525,966

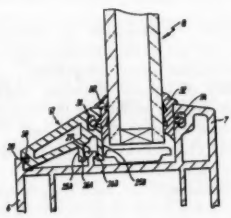
WINDOW SYSTEMS

Leon G. Litchfield, and Terence Hardy, both of Derby, England, assignors to L.B. Plastics Limited, Derby, England

Filed Jul. 16, 1982, Ser. No. 398,737

Int. Cl.³ E04B *1/62*

U.S. Cl. 52—397 **7 Claims**



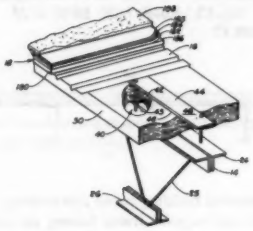
1. A window construction incorporating a pane or panes of glass retained in a frame by elongated glazing beads inserted between the glass and the frame at the outside of the window, each glazing bead comprising first retaining means at or adjacent its outer edge engageable with a co-operating retaining member on the frame and second retaining means at or adjacent its inner edge, said second retaining means comprising oppositely acting retaining formations engageable with at least one co-operating retaining member on the frame, each retaining formation being arranged to be more firmly engaged by movement of the associated bead in a direction to disengage the other formation.

4,525,967

SUPPORT SPACER APPARATUS FOR A BUILT-UP ROOF

Harold G. Simpson, Oklahoma City, Okla., assignor to Encon Products, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 93,173, Nov. 13, 1979, Pat. No. 4,329,823. This application Aug. 19, 1981, Ser. No. 294,329
The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.
Int. Cl.³ E04B *1/74*
U.S. Cl. 52—404 5 Claims



1. A roof assembly for a building having a primary support structure supporting a first secondary structural member and a second secondary structural member, each secondary structural member having a platform surface, the roof assembly comprising:

a layer of insulation, supported by the platform surfaces of the first and second secondary structural members;

a deck disposed in spaced overlaying relation to the insulation layer and the first and second secondary structural members;

first support spacer means, supporting the deck and operatively engaged to the first secondary structural member, for transferrng load from the deck to the first secondary structural member while maintaining the deck in adjacent, noncrushing relationship with the insulation layer, the first support spacer means comprising:

a spacer member having a first support surface and an opposite second support surface, the spacer member having a plurality of fastener apertures formed therein; and

fastener means for attaching the spacer member to the platform surface of the first secondary structural member, the fastener means comprising:

a plurality of column members extending from the second support surface of the spacer member in an assembled position thereof, each column member having a channelway communicating with one of the fastener apertures and extending to the distal end of the column member, each column member maintainable in substantially nonpenetrating engagement with the platform surface of the first secondary structural member when the first support spacer assembly is in its installed position; and

a plurality of fastener members extendable through the fastener apertures, each fastener member extendable through the channelway of one of the column members and attachable to the platform surface of the first secondary structural member so that the first support surface is disposed a predetermined distance from the platform surface in an attached position of the first support spacer means to the platform surface; and

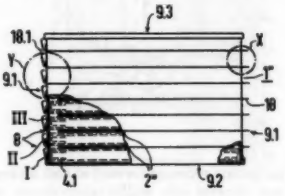
built-up roofing means, supported by the deck, for protecting the deck from atmospheric conditions and intrusion of moisture.

4,525,968

ALL-METALLIC HEAT INSULATION, FORMED OF HEAT INSULATING BUILDING BLOCKS WHICH CAN BE JOINED TOGETHER

Wolfgang-Peter Fricker, Freinsheim, and Manfred Scholz, Erlangen, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

Division of Ser. No. 229,645, Jan. 29, 1981,. This application Sep. 29, 1982, Ser. No. 426,789
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 3003708
Int. Cl.³ E04B *2/00*
U.S. Cl. 52—406 3 Claims



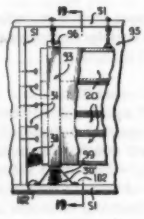
1. All-metal heat insulation, comprising building blocks which can be joined together, said building blocks each including metallic foils thermally movably supported and mutually spaced apart from each other forming insulating cells therebetween, said building blocks being substantially cube-shaped and said foils being substantially parallel to each other, spacer strips for maintaining said mutual spacing between said foils, and at least two housing plates at least partly surrounding said foils and spacer strips and being disposed at a given distance from each other, said spacer strips being adjacent to each other and being fastened to at least one of said housing plates, said spacer strips being mutually spaced apart from each other at a distance at least equal to the thickness of one foil forming receiving pockets for said foils at least at one of said plates, said foils being shorter than said given distance between said housing plates and being slideably fitted in said receiving pockets.

4,525,969

THERMAL INSULATING SYSTEM PARTICULARLY ADAPTED FOR BUILDING CONSTRUCTION

Harrison G. Dyar, P.O. Box 185, Tampa, Fla. 33601

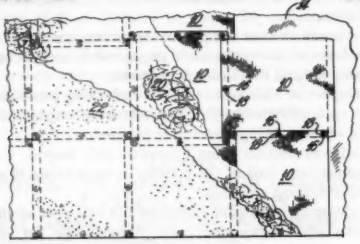
Division of Ser. No. 374,260, May 3, 1982, Pat. No. 4,454,697, which is a division of Ser. No. 215,083, Dec. 10, 1980, Pat. No. 4,344,395. This application May 24, 1984, Ser. No. 613,574
The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.
Int. Cl.³ E04B *1/78*
U.S. Cl. 52—407 12 Claims



1. A system for insulating building walls, ceilings, floors or like structure comprising wall means for forming a hollow insulating panel defining an interior chamber under negative pressure, flexible connector means contacting a limited exte-

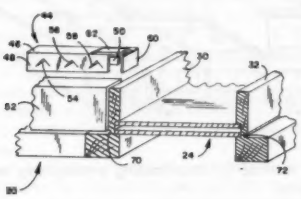
rior surface area of said panel for suspendingly supporting said panel in generally spaced relationship from an associated building wall, ceiling, floor or like structure, means normally spaced from the exterior surface of said panel for contacting a limited exterior surface area of said panel only upon said flexible connector means becoming inoperative which would in the absence of said contacting means result in direct contact between said panel and the associated building wall, ceiling, floor or like structure, said contacting means including a coil spring, and means for holding said coil spring in at least partially compressed condition while in its normally spaced relationship to the panel exterior surface.

4,525,970
INSULATED WALL CONSTRUCTION
Michael E. Evans, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Jul. 11, 1983, Ser. No. 512,256
Int. Cl.³ E04B 5/52
U.S. Cl. 52—454 **4 Claims**



1. An insulated outer wall construction for a building, said wall construction comprising a structural outer wall, a plurality of square fibrous glass insulation boards mounted in covering relationship to said outer wall on a side thereof facing outwardly of the building, each of said boards having a scrim adhesively secured thereto on an outer side, the scrim extending beyond the board respectively along two opposite edges thereof to provide a pair of flaps for respectively overlapping joints between adjacent boards, the boards of each pair of adjacent boards being oriented ninety degrees from each other whereby every joint between boards is overlapped by a scrim flap, and a coat of cementitious material covering said boards and scrim.

4,525,971
ATTACHMENT CLIP FOR SUSPENDED WOODBEAM CEILING
Gilbert G. Kera, 515 N. Victory Blvd., Burbank, Calif. 91502
Division of Ser. No. 407,652, Aug. 12, 1982, Pat. No. 4,464,879, which is a continuation-in-part of Ser. No. 259,858, May 4, 1981, Pat. No. 4,454,700, which is a continuation-in-part of Ser. No. 28,904, Apr. 10, 1979, Pat. No. 4,281,498. This application Apr. 9, 1984, Ser. No. 598,410
Int. Cl.³ E06B 3/54
U.S. Cl. 52—484 **7 Claims**



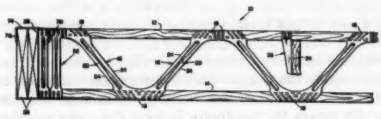
1. An attachment clip in combination with a suspended woodbeam ceiling wherein said woodbeam ceiling comprises:

a first beam, said first beam comprising first and second upstanding longitudinal woodbeam side members, a beam center attached to and positioned between said woodbeam side members to maintain said side members in spaced relationship;

a second beam, said second beam comprising at least a first longitudinal woodbeam side member, said second beam lying at right angles to said first beam so that both of said upstanding woodbeam side members on said first beam lie against said longitudinal woodbeam side member of said second beam, and wherein said attachment clip comprises:

a body having a web and first and second flanges forming an inverted U-shaped body, said inverted U-shaped body being sized to fit down over the top of one of said first and second upstanding longitudinal woodbeam side members to retain said body on the side member of said first beam, and a hook on said body for engaging over said side member of said second beam to retain said first beam adjacent said second beam, and a strengthening rib formed in said web adjacent said hook to strengthen said hook where it extends beyond said flanges.

4,525,972
TRUSS ASSEMBLY AND BRACING CLIP AND ATTACHMENT MEMBER FOR USE WITH TRUSSES
Joaquin J. Palacio, and Carlos C. Cristobal, both of Miami, Fla., assignors to Gang Nail Systems, Inc., Miami, Fla.
Filed Sep. 24, 1982, Ser. No. 423,252
Int. Cl.³ E04C 3/02
U.S. Cl. 52—643 **13 Claims**



1. A bracing clip for use in connecting a beam to a wooden member with the longitudinal axis of the beam extending transversely to the longitudinal axis of the wooden member, said bracing clip comprising:

(a) a connector plate disposed within a first plane having a plurality of sharp projections extending generally perpendicular from the plane of the plate for use in fixedly attaching the connector plate to the wooden member;

(b) a first side portion attached to and extending from the lower end portion of the connector plate, said side portion generally being within said first plane;

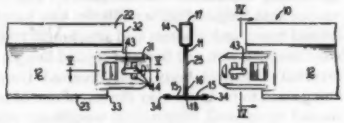
(c) a second side portion disposed within a second plane and attached to said first side portion and forming approximately a 90 degree angle with said first plane and extending in the same direction as said sharp projections of said connector plate, the surface of said second side portion being generally parallel to the longitudinal axis of the beam when the second side portion surface is in contact with the width of the beam, the upper end portion of said second side portion terminating below the level of the connector plate, thus allowing the connector plate to be fixed to the wooden member in face-to-face abutment therewith; and

(d) a third portion disposed within a third plane and joined to said second portion along the lower end portion thereof and forming approxmately a 90 degree angle with the plane of said second portion, the third portion being substantially perpendicular to the first portion and the surface of said third portion being adapted for supporting said beam underneath and across its thickness.

4,525,973
SUSPENDED CEILING SYSTEM

Ronald W. Vukmanic, Naperville; John S. Borucki, Bloomingdale, and Chester A. Stanley, Des Plaines, all of Ill., assignors to Chicago Metallic Corporation, Chicago, Ill.

Filed Jan. 9, 1984, Ser. No. 569,454
Int. Cl.³ E04C 2/42; F16B 7/22
U.S. Cl. 52—667 9 Claims

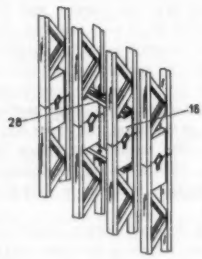


1. A suspended ceiling system comprising main members extending parallel to each other and cross members extending between the main members at spaced intervals, each of said members having an inverted tee configuration with a pair of oppositely extending flanges connected by a web portion to a bead, each cross member having ends with an end surface of the bead extending beyond end surfaces of the flanges by an amount slightly less than the width of a single flange and the web portion having a tongue extending beyond both the end surfaces of the bead and flanges, each of the webs of the main members having elongated slots for receiving the tongue of the cross member with the end surface of the bead contacting the bead of the main member as the end surfaces of the flange of the cross member engage an outer edge of the flange of the main member, each of the tongues having first means cooperating with the elongated slot to lock the tongue in the slot and second means cooperating with second means of another tongue to interconnect the two tongues together to form an end-to-end joint between cross members extending into the elongated slot from opposite directions, said first means including a pair of tabs forming a pair of catch surfaces facing away from the end of the tongue, said tabs being spaced apart by an elongated aperture extending parallel to the bead and being positioned in the tongue with a portion extending on each side of the web of the main member to provide apertures for receiving clip means for positively locking the cross member to the main member.

4,525,974
WOOD BEAM

Manfred Steidle-Sailer, Sigmaringen, and Matthias Andres, Beuren, both of Fed. Rep. of Germany, assignors to Emil Steidle GmbH & Co., Fed. Rep. of Germany

Filed Nov. 3, 1981, Ser. No. 317,744
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041370
Int. Cl.³ E04C 3/02
U.S. Cl. 52—693 19 Claims

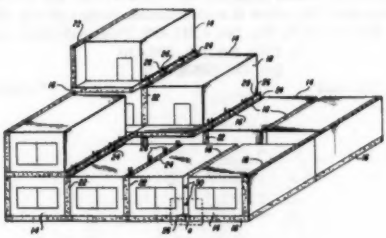


1. An assembly of beams wherein each beam comprises:
a first flange extending in one direction; a second flange extending in the one direction, being above and spaced away from the first flange; the flanges having one end; a solid web attached to and extending between the flanges at the one end for holding the flanges in their position; the solid web having a butt end facing outwardly of the one end and the butt end being shaped for flush abutment with the butt end of an adjacent solid web of another of the beams;
a recess defined in the butt end and extending completely across the solid web transversely to a direction between the flanges; the recess being internally geometrically profiled for receiving therein an adapter section of substantial geometric profile;
an adapter section profiled to the internal profile of the recess for being received in the profiled recess; the adapter section extending across the solid web transversely to the direction between the flanges; the adapter section being shaped to project out of the recess and out of the butt end of the solid web for being received in a cooperating profiled recess in an adjacent solid web of an adjacent one of the beams;
and wherein at least one pair of said beams are arranged with their respective butt ends in engagement, and the butt ends being shaped for flush engagement;
the respective recesses in the butt ends being placed to overlie each other when the butt ends are in engagement, and the recesses being identically profiled;
the adapter section being symmetrically shaped, with one symmetrical half of the adapter section being in each of the overlying recesses;
and clamping means for clamping the butt ends of the solid webs into engagement and thereby also for securely clamping the adapter in the overlying recesses;
the said clamping means engaging and squeezing together the solid webs of said butted adjacent beams;
the said beam assemblies being arranged parallel to each other, and the solid webs of the beams of two of the beam assemblies being arrayed along side of each other and spaced apart and the two assemblies being spaced apart; and wherein the clamping means comprises transverse members extending between the solid webs of the two assemblies, whereby the clamping means simultaneously clamp together the solid webs of the two beam assemplies.

4,525,975
MODULAR HIGH RISE CONSTRUCTION UTILIZING ASSEMBLY LINE MODULES

Gary V. McWethy, P.O. Box 464, Batavia, N.Y. 14020

Continuation-in-part of Ser. No. 245,019, Mar. 18, 1981. This application Dec. 6, 1982, Ser. No. 447,433
Int. Cl.³ E04H 1/00
U.S. Cl. 52—745 17 Claims



1. A method for constructing a multistory building which comprises:
(a) constructing finished modules having a reinforced concrete base at least 2 inches thick and having vertical sidewalls, said base extending beyond said sidewalls about

one-half the distance that the modules are to be spaced apart in the finished building;

(b) placing first series of such finished modules with their bases at a single horizontal level in relationship with each other such that at least a portion of one sidewall of each module is spaced by a distance of from about 2 to about 24 inches from and is parallel to the sidewall of another such module;

(c) securing said modules together by mechanically connecting said sidewalls;

(d) pouring and hardening concrete between such spaced sidewalls and extended base portions to fill at least a portion of such space to form supporting concrete walls;

(e) placing an additional series of such finished modules upon the tops of the previously poured and hardened supporting concrete walls such that the bases of the modules in the additional series are at a horizontal level at the tops of the previously poured and hardened supporting concrete walls, the modules in the additional series being in relationship with each other such that at least a portion of one sidewall of each such module is spaced by a distance of from about 2 to about 24 inches from and is parallel to the sidewall of another such module; and

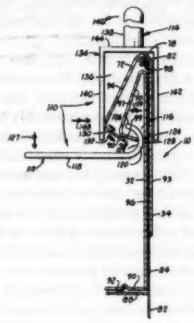
(f) pouring and hardening concrete between such spaced sidewalls and extended base portion of the modules in the additional series to fill at least a portion of such space to form additional supporting concrete walls.

4,525,976

METHOD AND APPARATUS FOR ASSEMBLING STANDING SEAM ROOFS

Harold G. Simpson, Oklahoma City, Okla., assignor to Encon Products, Inc., Oklahoma City, Okla.

Filed Apr. 4, 1983, Ser. No. 481,858
Int. Cl.³ E02D *35/00*
U.S. Cl. 52—748 **13 Claims**



1. An apparatus for enhancing joint integrity of a seam formed by union of adjacently disposed panels wherein one panel is provided with a female member and the other panel is provided with a male member, the female member adapted to receive the male member in a locking relationship such that a recessed portion is formed within the male member, the apparatus comprising:

first hand implement means positionable within the recessed portion of the male member for selectively moving the male member into a seating, substantially watertight sealing relationship with the female member when force is applied to the male member via the first hand implement means; and

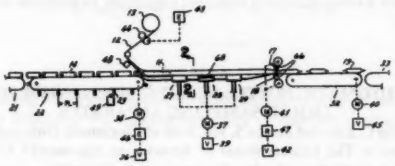
second hand implement means for exerting force on the female member in a direction substantially opposite the force exerted on the male member via the first hand implement means, the second hand implement means positionable over the female member such that upon application of force to the second hand implement means the second hand implement means cooperates with the first hand implement to selectively move the male member into a union with the female member.

4,525,977

WRAPPING MACHINE AND METHOD

Timothy S. Matt, Bay Village, Ohio, assignor to Doboy Packaging Machinery, Inc., New Richmond, Wis.

Filed May 13, 1983, Ser. No. 494,126
Int. Cl.³ B65B *9/06, 57/00*
U.S. Cl. 53—55 **7 Claims**



7. A method of wrapping products in packages formed from a continuous film of packaging material comprising the steps of:

shaping a continuous film of packaging material in a former by drawing the film past the former into the shape of a continuous tube;

drawing the continuous film of packaging material past the former and past a cutting and sealing station at a velocity dependent upon a film velocity control signal;

feeding products to be packaged into the former and the continuous tube of packaging material at a velocity dependent upon a product infeed velocity control signal;

cutting and sealing the continuous tube of packaging material as each product moves past the cutting and sealing station dependent upon a cutting and sealing control signal; and

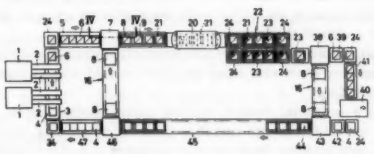
producing the film velocity control signal, the product infeed velocity control signal, and the cutting and sealing control signal utilizing a microprocessor-based controller.

4,525,978

STERILIZING SYSTEM FOR FILLED AND SEALED ARTICLES

Masao Hayase, and Yozo Araki, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and House Food Industrial Co., Ltd., Osaka, both of, Japan

Filed Aug. 31, 1982, Ser. No. 413,254
Claims priority, application Japan, Sep. 17, 1981, 56-145452; Sep. 18, 1981, 56-137539[U]; Sep. 18, 1981, 56-146095; Sep. 18, 1981, 56-146096
Int. Cl.³ B65B *35/30*
U.S. Cl. 53—167 **5 Claims**



1. In a sterilizing system having a loading apparatus for loading onto trays, packed articles filled and sealed at a filling and sealing station, a first palletizer for loading said trays filled with said packed articles onto a pallet, a sterilizer for sterilizing filled and sealed articles disposed on said pallet, a first depalletizer for removing the trays from the pallet, one-by-one, which have been removed from said sterilizer and a packed-article

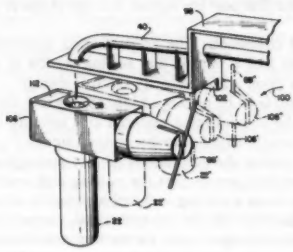
extracting apparatus for removing filled and sealed articles loaded on said separated trays to a packing apparatus, the improvement which comprises a first pallet-transport conveyor for conveying said pallet having said trays separated therefrom, a second palletizer for supplying empty trays having said filled and sealed articles removed therefrom from said article extracting apparatus and loading said empty trays onto said pallet transported by said first pallet-transport conveyor, a pool transporting conveyor for pooling said pallet loaded with said empty trays, a second depalletizer for removing the trays one-by-one from said pallet transported by said pool transporting conveyor and for supplying trays to said loading apparatus and a second pallet-transport conveyor for transporting said pallet having said trays removed therefrom to said first palletizer.

4,525,979

AUTOMATIC BOTTLE SEALING MECHANISM FOR LIQUID SAMPLING APPARATUS

Philip C. Lin, and James S. Ho, both of Cincinnati, Ohio, assignors to The United States of America as represented by the Administrator of the Environmental Protection Agency, Washington, D.C.

Filed Oct. 19, 1982, Ser. No. 435,169
Int. Cl.³ B65B 3/06, 7/16
U.S. Cl. 53—268 **15 Claims**



1. A bottle sealing mechanism for automatically sealing a bottle comprising:

(a) a cap body adapted to be fitted over the mouth of said bottle, said body including a throat for receiving a substance and conducting it through the mouth of said bottle, said throat including a top opening for receiving a substance and a bottom opening for delivering said substance to said bottle;

(b) a movable closure member capable of moving into an open position, wherein said throat is open, and a closed position, wherein said throat is closed, said movable closure member including a slidable vane which is slidable across said throat between said top opening and said bottom opening and selectively moveable to an open throat or a closed throat position, and

(c) an actuating means for automatically moving said closure member from said open position to said closed position, including:

(i) a potential energy storing means connected to said movable closure member capable of moving said closure member from an open position to a closed position when said energy is released, said potential energy storing means including a spring having one end in contact with said slidable vane and being in a state of compression when the vane is in said open throat position, and

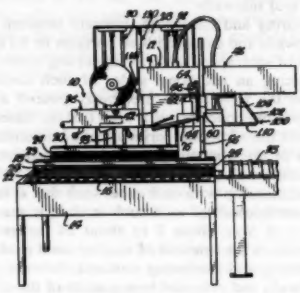
(ii) a latch means for releasing the potential energy stored in said storing means, said latch means including a trip rod which is mechanically connected to said one end of the spring by means of a connecting hook.

4,525,980

APPARATUS FOR SEALING CARTONS

Lawrence W. Ulrich, Cicero, and Connie W. Walker, Bolingbrook, both of Ill., assignors to Durable Packaging Corporation, Chicago, Ill.

Filed Apr. 18, 1983, Ser. No. 486,258
Int. Cl.³ B65B 7/20
U.S. Cl. 53—374 **8 Claims**



1. In combination with apparatus of the type used for sealing the foldable flaps of cartons of random sizes, said apparatus including a frame structure, a vertically movable flap folding assembly mounted to said frame structure, power means for vertically moving said flap folding assembly towards and away from a carton positioned therebelow; an improved arrangement for positioning said flap folding assembly at or immediately above the upper edges of the walls of the carton without crushing said upper edges, comprising: a brake assembly for selectively retaiing said sealing head assembly in a fixed position; a control means associated with said brake assembly which upon activation prevents the downward movement of said sealing head assembly; an actuator pivot bar pivotally mounted about a generally horizontal axis, said actuator pivot bar movable between a first generally horizontal position and a second inclined position; and an actuator link mounted for movement relative to said flap folding assembly between a first position wherein said control means is activated and a second position wherein said control means is inactivated, said actuator pivot bar being pivotally mounted to said actuator link such that as said actuator pivot bar contacts the upper edge of a carton and moves into its first position said actuator link moves into its first position and as the carton leaves the apparatus and the actuator pivot bar moves into its second position said actuator link moves into its second position, said actuator link and said actuator pivot bar are biased towards their second positions, said actuator link has an upper end which is secured to an actuator adjustment block which contacts and actuates said control means, said actuator adjustment block having a threaded shaft to adjust the activation of said control means as said actuator pivot bar attains its first position and prior to said flap folding assembly applying crushing forces to the end walls of the carton.

6. In combination with apparatus of the type used for sealing the foldable flaps of cartons of random sizes, said apparatus including a frame structure, a vertically movable flap folding assembly mounted to said frame structure, power means for vertically moving said flap folding assembly towards and away from a carton positioned therebelow; and improved arrangement for positioning said flap folding assembly at or immediately above the upper edges of the walls of the carton without crushing said upper edges, comprising: a brake assembly for selectively retaining said sealing head assembly in a fixed position; a control means associated with said brake assembly which upon activation prevents the downward movement of said sealing head assembly; an actuator pivot bar pivotally mounted about a generally horizontal axis, said actuator pivot

bar movable between a first generally horizontal position and a second inclined position; and an actuator link mounted for movement relative to said flap folding assembly between a first position wherein said control means is activated and a second position wherein said control means is inactivated, said actuator pivot bar being pivotally mounted to said actuator link such that as said actuator pivot bar contacts the upper edge of a carton and moves into its first position said actuator link moves into its first position and as the carton leaves the apparatus and the actuator pivot bar moves into its second position said actuator link moves into its second position, said actuator link and said actuator pivot bar are biased towards their second positions, said brake assembly includes a generally vertical brake bar secured to said frame structure and a brake unit secured to said sealing head assembly and movable therewith, said brake unit being positioned to receive said brake bar so as to selectively clamp said brake unit to said brake bar upon activation of said control means.

4,525,981

METHOD OF MAKING A BOOK OF MATCHES

Eric W. Parein, Faiderstraat 79, Elsene, Belgium (B-1050)

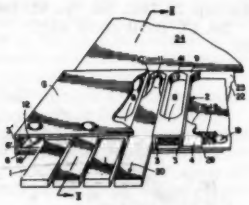
PCT No. PCT/BE82/00010, § 371 Date Jan. 5, 1983, § 102(e) Date Jan. 5, 1983, PCT Pub. No. WO82/03973, PCT Pub. Date Nov. 25, 1982

PCT Filed May 14, 1982, Ser. No. 456,057

Claims priority, application Belgium, May 15, 1981, 0/204805

Int. Cl.³ C06F *1/26*; A24F *27/12*

U.S. Cl. 53—395 **11 Claims**



1. The method of making a book of matches, which comprises the steps of:

(a) providing a sheet-like succession of separate matches having heads at one end thereof;

(b) relatively inserting said sheet-like succession of matches head end first and longitudinally into a succession of recesses of a relatively flat matchbook case having opposite faces;

(c) preparing matches of said succession for automatic striking in response to longitudinal withdrawal from their recesses by affixing at least one sheet carrying striking material to one of the opposite faces of said core.

4,525,982

METHOD OF, AND APPARATUS FOR, REMOVING FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS, FROM A WINDING CORE

Jacques Meier, Bäretswil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Nov. 29, 1982, Ser. No. 445,564

Claims priority, application Switzerland, Dec. 9, 1981, 7855/81

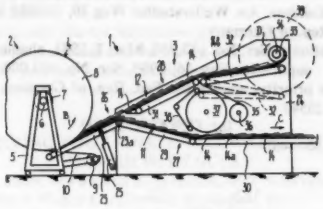
Int. Cl.³ B65B *63/04*; B65H *29/70, 1/22*

U.S. Cl. 53—430 **22 Claims**

1. A method of removing substantially flat products, especially printed products, wound in two product formations, especially imbricated formations, from a winding core, comprising the steps of:

unwinding said products from said winding core by simultaneously unwinding the first product formation and the second product formation;

directly transporting away said first product formation after unwinding the same; and



transporting away said second product formation with a time-delay following the transporting away of said first product formation.

4,525,983

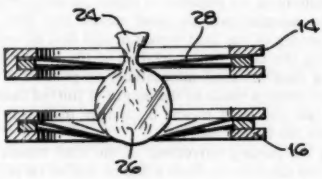
WRAPPING AND SEALING APPARATUS

Mitchell Libow, 1952 Coldwater Canyon, Beverly Hills, Calif. 90210

Filed Oct. 12, 1982, Ser. No. 433,794

Int. Cl.³ B65B *11/06, 51/10*

U.S. Cl. 53—463 **18 Claims**



17. A method for wrapping and sealing objects, such as fresh lettuce heads, comprising the steps of:

dispensing a sheet of thin plastic film wrapping material across the top of a fabric tube type receiving iris valve;

said fabric tube type iris valve including a pair of open circular frame members to which the ends of a fabric tube are secured, with the frame members being rotatable with respect to one-another to open and close the iris valve;

placing the object to be wrapped and sealed on the sheet of plastic film so that said object and film are supported by the closed iris valve;

opening the iris valve following the placement of the object on said valve;

supporting the object so that its top surface is just below the iris valve;

at least partially closing the iris valve to draw the plastic sheet material together and around the object to be wrapped and sealed;

heat sealing the plastic sheet material over the object being wrapped; and

shifting the wrapped and sealed object away from its location immediately below the iris valve to permit the wrapping and sealing of the next object;

whereby fragile articles to be wrapped are supported and cushioned by the fabric of the fabric tube type iris valve, and the rotary closing motion of the fabric valve automatically twists the plastic film as the object is being wrapped.

4,525,984

PROCESS AND DEVICE FOR PRODUCTION OF AN END CLOSURE ON A SHIRRED LENGTH OF TUBULAR MATERIAL, ESPECIALLY SYNTHETIC CASING FOR SAUSAGE MANUFACTURE

Günter Kollross, Am Wallerstadter Weg 20, D-6081 Dornheim, Fed. Rep. of Germany

Continuation of Ser. No. 243,953, Mar. 2, 1981, abandoned. This application Sep. 16, 1983, Ser. No. 533,006

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1979, 2926543

Int. Cl.³ A22C *13/00*

U.S. Cl. 53—483 24 Claims

1. A method of closing off an end of a length of shirring casing material, such as synthetic casing material used for making sausages, comprising the steps of:

moving a shaft means coaxially relative to the said length of shirred casing material against the last shirrs of the shirred material at an open end thereof, wherein the largest cross-sectional dimension of the shaft means is smaller than the outer diameter of the length of shirred casing material and larger than the inside diameter of the length of shirred casing material,

maintaining the pressure of the shaft means against the casing material and turning the shaft means for as many revolutions as are required to tighen an end portion of the casing material onto the shaft means, and then stopping the turning of the shaft means in said first direction,

retracting the shaft means relative to the length of shirred casing material, until substantially no portion of the shaft means remains inside of the length of shirred casing material, and the shaft means no longer maintains pressure against the casing material,

starting the turning movement of the shaft means again in said first direction to form a double walled twist, stopping the turning movement in said first direction, and,

then pushing the casing material coaxially back into the length of shirred casing material,

and retracting the shaft means from the shirred length of casing material.

4,525,985

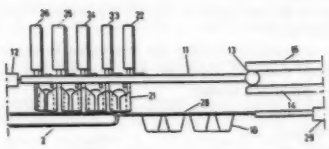
APPARATUS FOR AUTOMATICALLY PACKAGING ARTICLES

Bo Sammens, Sättra, S-387 00 Borgholm, Sweden, assignor to Bo Sammens, Borgholm, Sweden

Filed Mar. 29, 1983, Ser. No. 479,960

Int. Cl.³ B65B *57/14, 5/08*

U.S. Cl. 53—497 13 Claims



4. Packaging apparatus for automatically aligning and inserting discrete articles comprising: conveyor means for conveying said articles in a given direction of travel; aligner means comprising a plurality of aligning arms arranged to extend laterally across said direction of travel, said aligning arms being arranged consecutively so as to be operable for aligning said articles in successive rows; a grouping unit comprising a plurality of guide arms which are arranged to extend laterally across said direction of travel and which are located consecutively relative to each other so as to be useful for grouping said articles to form packaging modules, said grouping unit being arranged so that it operates to transfer said articles by operation of said guide arms from said conveyor means into packages adapted to receive said articles, and trolley means located to extend above said conveyor means and said packages and having said guide arms of said grouping unit mounted thereon, first air cylinder means for moving said guide arms between a lower active position and a higher inactive position, second air cylinder means for moving said trolley between a first position where said grouping unit is located above said conveyor means to a second position where said grouping unit is located above said packages, and detector means arranged on said trolley adjacent to each of said guide arms to sense the presence of a row of articles beside an associated guide arm, said detector means operating to move said guide arms from said inactive positions to said active positions by actuation of said first air cylinder means when said detectors sense the presence of a row of articles beside said guide arms.

4,525,986

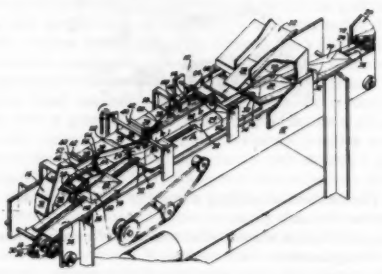
APPARATUS AND PROCESS FOR INSERTING INSERTS INTO ENVELOPES

Marvin H. Noll, 208 Howard Ave., Passaic, N.J. 07055

Filed Sep. 28, 1982, Ser. No. 425,890

Int. Cl.³ B65B *43/39, 43/52*

U.S. Cl. 53—569 18 Claims



1. An apparatus for inserting an array of inserts into a corresponding array of envelopes, said apparatus comprising:

an envelope conveyor means for continuously conveying the array of envelopes in a longitudinal direction; and

an insert conveyor means for continuously and simultaneously conveying the array of inserts in: (1) a first direction parallel to said longitudinal direction and at the same speed and in the same direction as said array of envelopes; and (2) a second direction extending at an angle to said longitudinal direction, said insert conveyor means comprising an elongated conveyor loop having inner and outer peripheries, and at least one linear bearing fixedly mounted on the outer periphery of said loop such that said linear bearing moves with said loop and causes an insert in said array of inserts to be moved in said first direction, and an insert pusher means slidably mounted on each said linear bearing; and

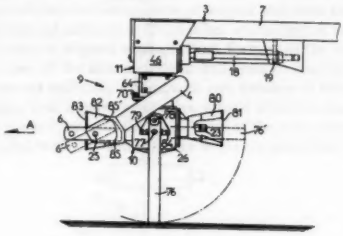
an insert cam, said insert cam including at least one portion disposed at an acute angle to the longitudinal direction, said insert pusher means being operative to follow the insert cam and move the insert in the second direction a sufficient distance to insert the insert into an envelope of the array of envelopes whereby said inserts are sequentially and continuously inserted into said array of envelopes.

4,525,987

AGRICULTURAL MACHINE

Anton Werner, Saverne, and Jean-Paul Gantzer, Lutzelbourg, both of France, assignors to Kuhn, S.A., Saverne, France

Filed Apr. 17, 1984, Ser. No. 601,304
Claims priority, application France, May 3, 1983, 83 07481
Int. Cl.³ A01D *69/00*; F16H *37/00*
U.S. Cl. 56—15.2 **13 Claims**



1. An agricultural machine to be pulled by a tractor and having working tools driven by outer driving sources, the machine comprising

a chassis arranged to support working tools;

a beam unit arranged for connecting said chassis to a tractor and including a first beam and a second beam;

a transmission including a first portion and a second portion turnable relative to one another about an upwardly directed axis, said first portion being connected with said first beam so that it can turn relative to one another about said upwardly directed axis, said second portion being fixed to said second beam;

locking means arranged to lock the rotation between said first portion and said first beam; and

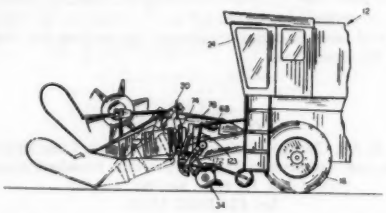
driving means arranged in said transmission and including two input shafts located in said first portion and adapted to receive the movement from one outer driving source, an output shaft located in said second portion and adapted to transmit movement to the working tools at approximately the same speed independently of said input shaft which receives the movement, and intermediate driving means interconnecting said two input shafts and said output shaft, the working position of the input shaft which receives the movement of one outer driving source being determined by said locking means which locks the rotation between said first portion and said first beam.

4,525,988

COMBINE PLANTER IMPLEMENT

Dale Harlan, Hickman, Nebr. 68372

Filed Aug. 18, 1983, Ser. No. 524,406
Int. Cl.³ A01D *45/00*; B60K *17/28*
U.S. Cl. 56—16.8 **27 Claims**



27. A method of supporting a planter implement on an agricultural combine having a chasis, front drive wheels supporting said chasis, a rear trash discharge, a throat portion pivotally connected to said chasis and extended forwardly of the front wheels, a cutter head attachment means on said throat portion, and a cutter head adapted for attachment to said cutter head attachment means, comprising,

mounting said planter implement on said cutter head attachment means,

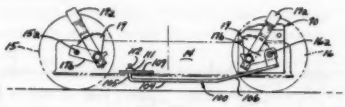
providing said planter implement with auxiliary cutter head attachment means, and mounting said cutter head on said auxiliary cutter head attachment means.

4,525,989

FLOATING FOOT SHIELD FOR WALK-BEHIND MOWER WITH SULKY

Joseph J. Lane, and Joseph E. Scanland, both of Savannah, Ga., assignors to Roper Corporation, Kankakee, Ill.

Filed Aug. 1, 1983, Ser. No. 518,818
Int. Cl.³ A01D *53/08, 53/00*
U.S. Cl. 56—17.4 **15 Claims**



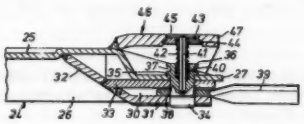
1. In a walk-behind lawn mower having a deck with vertical side walls and front and rear ground wheels supporting said deck, said ground wheels having a respective front and rear axles, the improvement comprising a side shield having first and second ends and extending longitudinally along one said deck side wall, pivotal attachment means for securing said first end of the side shield to one of the wheel axles and mounting means on the deck side wall remote from the wheel axles for supporting the second end of said side shield, said second end of the side shield being upwardly extending, said mounting means for the second end of the side shield including means on the deck side wall for receiving and supporting said upwardly extending side shield end for relative vertical movement, and said pivotal attachment means and mounting means cooperating to permit vertical movement of the side shield relative to said deck for enabling passage of said side shield over minor irregularities in the ground over which the mower is operated.

4,525,990

DEVICE FOR MOWING CROP

Petrus W. Zweegers, Nieuwendijk 46, Geldrop, Netherlands

Filed Dec. 13, 1982, Ser. No. 449,980
Claims priority, application Netherlands, Dec. 15, 1981, 8105634; Apr. 27, 1982, 8201734; Jul. 6, 1982, 8202701
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—295 **14 Claims**



1. A device for mowing crops and having a substantially dish-shaped cutting member having a rim portion and rotatable around a vertical axis, said cutting member comprising a plurality of pivot pins carried thereon and extending substantially parallel to said vertical axis of rotation, a cutting knife pivotably mounted on each of said pivot pins, a protective hood mounted on an upper surface of the rim portion of said cutting member over each said pivot pin and having a radially extending central portion and two adjoining tangentially disposed

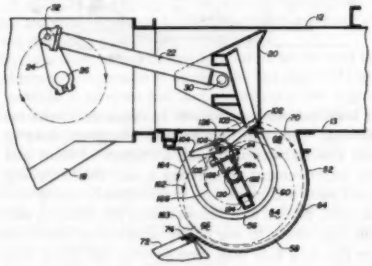
downwardly inclined portions, a coil compression spring on each said pivot pin having one end exerting a downward force on said pivot pin and having another end exerting a force on the underside of the central portion of said respective protective hood, each said protective hood having at least a portion thereof spaced above said cutting knife pivot pin to define a space to accommodate said spring, each said space being open in a radial direction at the outer circumference of said cutting member to provide access to the pivot pin to enable the pin to be moved against said spring so that the cutting knife can be removed.

4,525,991

BALER FEEDER MECHANISM

Adrianus Naaktgeboren, Veldegem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Jan. 9, 1984, Ser. No. 569,438
Int. Cl.³ A01D *89/00, 59/02*
U.S. Cl. 56—341 **13 Claims**



1. A baler comprising:
(a) a bale case having an inlet opening formed therein;
(b) a duct communicating at one end with said inlet opening in said bale case;
(c) feed means including a first set of feeder elements arranged to pack crop material into said duct and a second set of feeder elements arranged to stuff crop material from said duct into said bale case through said inlet opening,
(d) said first and second sets of feeder elements each being rotatable in one direction about one axis and in the opposite direction about another axis which is offset relative to said one axis; and
(e) the feeder elements of said first set mounted on a shaft and having outer ends following a first path of movement and the feeder elements of said second set also mounted on said shaft and having outer ends following a second path of movement, and said first and second paths of movement being offset relative to each other so that only said second path of movement passes through said bale case.

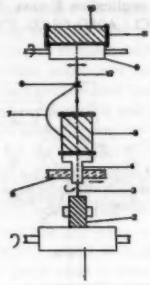
4,525,992

PROCESS FOR MAKING COVERED ELASTANE YARN

Pierre Payen, Lyons, France, assignor to L. Payen and Cie, S.A., Lyons, France

Filed Oct. 26, 1982, Ser. No. 436,738
Claims priority, application France, Nov. 2, 1981, 81 20711
Int. Cl.³ D02G *3/32*
U.S. Cl. 57—18 **5 Claims**

1. A process for covering an elastane yarn stretched from three to five times, comprising the steps of:
disposing a single covering material with a twist in the range of ¼ to ½ the usual twist of a single covering, over a stretched elastane yarn, forming a covered yarn;
winding said single covered yarn on a bobbin, forming a bobbin of covered yarn;
taking up said bobbin of covered yarn onto a twisting member;
twisting said single covered yarn in the same direction as the direction of twist of the covering material; and



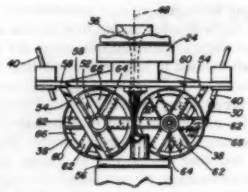
twisting said covered yarn on said twisting member until said single covered yarn develops a twist equal to the usual twist of a single covering.

4,525,993

TWISTING MACHINE

André Dumoulin, Montagnes; Marc Séguin, Ile Perrot, and Jean Bouffard, Lachine, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 27, 1983, Ser. No. 565,632
Int. Cl.³ D01H *1/10, 7/86*
U.S. Cl. 57—58.52 **4 Claims**



1. A twisting machine for filamentary material having a guide pulley freely rotatably mounted about a first axis upon a support which is rotatable about a second axis, the pulley having a rim portion defining a peripheral guide channel for the material and a plurality of impeller surfaces extending inwardly of the rim portion and facing from one side of the pulley at an angle to the first axis whereby flow of air impinging upon the impeller surfaces and at said one side of the pulley applies a rotational force upon the pulley around said first axis, and the pulley lies in a plane extending in a direction having a radial component to the second axis to cause air to impinge upon said surfaces during rotation of the support and pulley about the second axis.

4,525,994

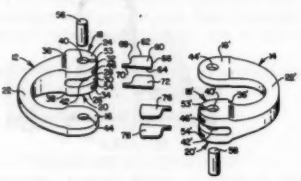
COUPLING LINK

Mark R. Alt, Chicago Heights, Ill., and John R. Olds, Schererville, Ind., assignors to Abex Corporation, Stamford, Conn.

Filed Jun. 12, 1984, Ser. No. 619,863
Int. Cl.³ F16G *15/04*
U.S. Cl. 59—85 **6 Claims**

1. A coupling link comprising:
a first half link and a second half link each link comprising a unitary member with a pair of spaced ears at one end, a tongue at the other end and a central body member which

joins the ears and the tongue, each ear defined by a top wall, a bottom wall, a front surface and a rear surface, a pin receiving bore formed in each ear which opens into the top and bottom walls, a lateral slot formed in each ear which opens into the front surface, the pin bore and the rear surface between the top and bottom walls, wherein the bores formed in the pair of ears of one of the first or second half links are aligned with the bore formed in the tongue of the other of the first or second half links and the bores formed in the ears of the other of the first or second half links are aligned with the bore formed in the tongue of the one of the first or second half links so that the first and second half links mated with one another to form the coupling link, a pair of link pins, one of which is received in the bores formed in the pair of ears of the one of the first or second half links and the bore in the tongue of the other



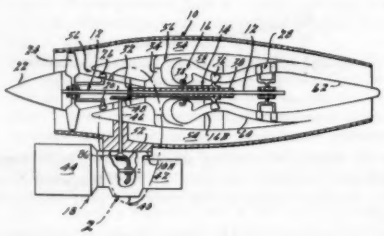
of the first or second half link and the other of which is received in the bores formed in the pair of ears of the other of the first and second half links and the bore in the tongue of one of the first or second half links, the length of each link pin being less than the distance between the slots in a pair of ears, the first link pin being positioned between the slots in the pair of ears in which it is received and the second link pin being positioned between the slots in the pair of ears in which it is received, a plurality of pin keepers one of which is received in each ear slot to close the pin bore in that ear to keep each of the link pins positioned between the slots in the pair of ears in which it is received, and each pin keeper includes a tang, movable relative to the pin keeper, which projects through the slot opening in one of the front or rear surfaces of ears and the tang is moved out of alignment with the one slot opening to retain the keeper within the ear slot.

4,525,995

OIL SCAVENING SYSTEM FOR GAS TURBINE ENGINE

Ralph J. Clark, Rochester, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Apr. 4, 1983, Ser. No. 481,719
Int. Cl.³ F02C 7/06
U.S. Cl. 60—39.08 **2 Claims**



1. A gas turbine engine comprising

A. a bearing cavity housing at least one bearing journaling a shaft of the engine;

B. means delivering lubricating oil to said cavity;

C. means allowing leakage airflow from a high pressure region of said engine into said cavity;

D. a scavenge oil pump arranged to deliver scavenge oil to an oil storage tank;

E. passage means interconnecting said cavity and the inlet of said scavenge oil pump;

F. vent means in said passage means adjacent the inlet of said pump venting said passage means to a low pressure region of the engine to induce a continuous flow of leakage air from said high pressure region into said cavity and induce a continuous flow of air and entrained scavenge oil through said passage means to the inlet of said pump; and

G. separator means in said passage means adjacent the inlet of said pump arranged to receive the air and oil mixture flowing through said passage means and operative to separate the oil and air and deliver the oil to the pump inlet and the air to said vent means;

H. an accessory gearbox positioned at the bottom of the engine housing;

I. said scavenge pump being driven by said gearbox;

J. said separator means being located in the bottom of said gearbox;

K. the interior of said gearbox communicating with a nozzle which opens in said passage means adjacent the inlet of said separator;

L. the air and oil mixture flowing in said passage means from said cavity being arranged to induce a flow of scavenge oil from said gearbox through said nozzle and into said separator;

M. a plurality of gears journaled in said accessory gearbox; and

N. gearbox passage means extending from a location adjacent the periphery of the topmost gear in said gearbox to said separator;

O. the inlet of the passage means in said gearbox being disposed tangentially with respect to the periphery of said topmost gear so that as said gear rotates during inverted operation of the engine the gear acts as a slinger to force scavenge oil from the gearbox to flow upwardly through said gearbox passage for delivery to said separator.

4,525,996

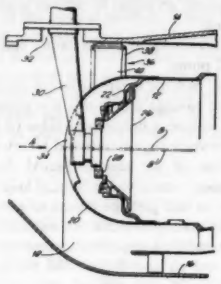
MOUNTING COMBUSTION CHAMBERS

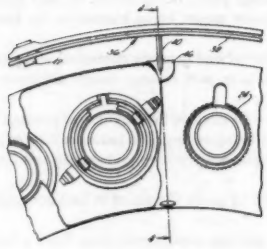
William B. Wright, and Anthony Pidcock, both of Derby, England, assignors to Rolls-Royce Limited, London, England

Filed Jan. 20, 1984, Ser. No. 572,450
Claims priority, application United Kingdom, Feb. 19, 1983, 8304682
Int. Cl.³ F02C 7/20
U.S. Cl. 60—39.31 **1 Claim**

1. A front mounting for a gas turbine engine annular combustion chamber in which the combustion chamber is located within an engine casing and a plurality of fuel burners are attached to the engine casing, each fuel burner locating within a ring of swirl vanes which are radially movable within an opening in an end wall of the combustion chamber, the combustion chamber having a semi-circular upstream wall attached to the end wall, the mounting comprising a flexible ring located between the engine casing and the combustion chamber and attached to the engine casing by a plurality of circumferentially spaced bolts and a plurality of radial struts which pass through openings in the upstream wall, the radially outer ends of each said strut are attached to the flexible ring and the radially inner ends of each said strut are formed as pins which slidably engage bushes attached to the radially inner part of the upstream wall of the annular combustion chamber, and of the bolts securing the flexible ring to the engine casing are located

circumferentially between adjacent ones of every other pair of openings in the combustion chamber end wall, and the radial





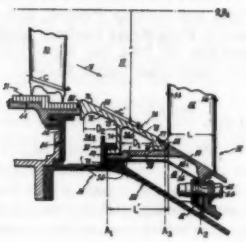
struts are staggered with respect to the securing bolts by an amount equal to the circumferential spacing of said openings.

4,525,997

STATOR ASSEMBLY FOR BOUNDING THE FLOW PATH OF A GAS TURBINE ENGINE

Walter J. Baran, Jr., South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 1, 1983, Ser. No. 518,908
Int. Cl.³ F02C *1/06;* F01D *5/08*
U.S. Cl. 60—39.161 **13 Claims**



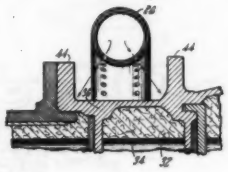
11. The stator assembly as claimed in claim **10** wherein the vane has a foot which traps the foot of the duct, and further has an airfoil having a leading edge, a trailing edge, and a chordwise dimension L extending between the leading edge and the trailing edge, wherein the distance from the airfoil edge nearest the vane foot to the end of the vane foot is a distance L' which is greater than or equal to L ($L' \geqq L$), wherein the length L' as compared with shorter lengths increases the resistance to the flow of heat from the edge region of the vane to the outer case at the first stator element and the overall length of the vane as compared with overall lengths that are shorter and increases the distance between the first and second locations to decrease the effect that differences in the radial growth of the case between the first location and the second location and the effect that tolerance variations in the radial height of the first foot of the vane and the radial height of the first foot of the duct have on the rotation of the airfoil of the vane in the axial direction about the second location.

4,525,998

CLEARANCE CONTROL FOR GAS TURBINE ENGINE

Frederick M. Schwarz, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 2, 1982, Ser. No. 404,085
Int. Cl.³ F02C *7/18*
U.S. Cl. 60—226.1 **3 Claims**



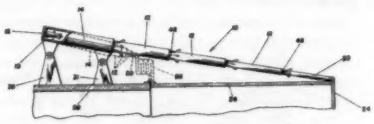
1. For a fan jet engine for powering aircraft having an engine case supporting a fan section, a compressor section, a combustion section, and a turbine section having rotating turbine blades therein, an active clearance control including a plurality of spraybars circumscribing the exterior of said case in proximity to the rotating turbine blades of one of said sections, a first source of air from said compressor section and a second source of air from said fan section, ducting means interconnecting said spraybars with said source from said fan section and said source from said compressor section, and valve means in said ducting means for selectively turning on and off either source so that one of said sources is operatively connected at a predetermined time of the flight envelope, and insulating lining means attached on the inner circumference of said engine case between said rotating blades and said spraybars for insulating the case from the heat being carried in proximity thereto.

4,525,999

ACTUATOR FOR DEPLOYING FLEXIBLE BODIES

Frank S. Inman, Brigham City, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Filed Dec. 23, 1982, Ser. No. 452,547
Int. Cl.³ F01B *29/08;* F15B *11/06, 15/22, 15/26*
U.S. Cl. 60—407 **1 Claim**



1. A self-locking telescoping actuator having high temperature resistant properties operable in a high temperature environment for deploying a flexible body operating therein comprising:

a plurality of telescopically arranged tubular members having a telescoped position and an extended position including an inner member having a closed inner end and an opposite open end, an outer telescoping member having a closed outer end attached to said body and an opposite open end and at least one intermediate telescoping member open at both ends, said inner member adapted to be

attached to a structure on which said body is to be deployed in fixed relation to said other members;

a gas generator in said fixed inner member providing a source of fluid pressure for extending said telescopically arranged members and thereby deploying said body;

said telescoping outer and intermediate members each having a resilient inner end for ease of telescoping said members into an adjacent member and an internal recess in an inner surface of an outer end portion of said inner and intermediate members;

an annular projection on each said resilient end for engaging said recess in member locking relation and being urged into said engagement by resilient force of said resilient end when said telescoping members are extended;

wherein said resilient end portion comprises means defining at least one axially extending slot in the open inner end of said outer member whereby radial bending of said end is facilitated and said projection is segmented; and

means for venting said pressurizing fluid produced by said gas generator when said members are in said extended position;

wherein said vent means is provided by said axially extending slot.

4,526,000

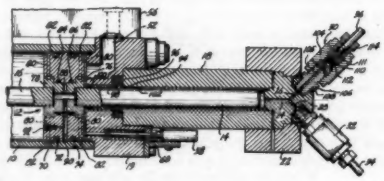
PRESSURE INTENSIFIER

Albert C. Saurwein, Auburn, Wash., assignor to McCartney Manufacturing Co., Inc., Baxter Springs, Kans.

Filed Oct. 18, 1983, Ser. No. 541,827

Int. Cl.³ F04B *35/00*; F01L *25/04*

U.S. Cl. 60—540 **7 Claims**



1. A fluid pressure-intensifying apparatus to provide a flow of high-pressure fluid comprising:

a low-pressure cylinder;

a low-pressure piston mounted in said low-pressure cylinder and separating said low-pressure cylinder into first and second low-pressure chambers;

a high-pressure cylinder associated with said low-pressure cylinder;

high-pressure piston means mounted in said high-pressure cylinder and connected in driven relationship to said low-pressure piston;

a source of low-pressure fluid at a predetermined pressure;

a tank for receiving a return flow of low-pressure fluid from said low-pressure cylinder;

a control valve operatively connected to said low-pressure cylinder to direct the flow of low-pressure fluid from said source alternately to said first and second low-pressure chambers to cause reciprocating movement of said low-pressure piston within said low-pressure cylinder, said control valve including a valve body, said valve body having a pressure port in fluid communication with said supply of low-pressure fluid, at least one tank port in fluid communication with said tank, a first working port in fluid communication with said first low-pressure chamber and a second working port in fluid communication with said second working chamber; and

a valve spool mounted within said valve body for movement between a first position in which it directs the flow of low-pressure fluid to said first low-pressure chamber and a second position in which it directs low-pressure fluid to said second low-pressure chamber, said valve spool constructed and arranged so as to maintain a substantially constant volumetric flow of low-pressure fluid from said low-pressure fluid source at a constant pressure when said valve spool is in said first and second position and in all intermediate positions between said first and second positions of said valve spool; wherein

said spool has first and second lands at opposite ends thereof, a third land intermediate said opposite ends, and recessed portions intermediate (a) said first and third lands and (b) said second and third lands;

said spool further has first slots formed only in said recessed portions thereof, and a plurality of second slots formed therein;

each of said second slots is formed partially in one of said recessed portions and partially in one of said first and second lands; and

major lengths of given ones of said second slots are formed in said one recessed portion, and major lengths of others of said second slots are formed in said one land.

4,526,001

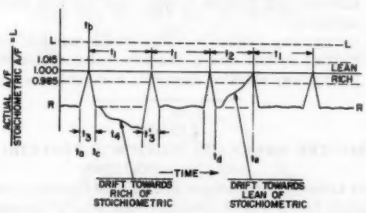
METHOD AND MEANS FOR CONTROLLING AIR-TO-FUEL RATIO

Kenneth R. Burns, Westfield, and Jack J. Early, Perth Amboy, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 235,071, Feb. 13, 1981, abandoned. This application Oct. 7, 1982, Ser. No. 433,199

Int. Cl.³ F01N *3/20*; F02B *33/00*

U.S. Cl. 60—274 **24 Claims**



1. The combination of an air-to-fuel ratio control system and a fuel burning mechanism, said fuel burning mechanism having an adjustable air-fuel proportioning device, a combustion chamber and an exhaust conduit serially interconnected in flow communication whereby a selectively proportioned air-fuel mixture may be introduced from said proportioning device into said combustion chamber for combustion therein, and exhaust gases may be withdrawn therefrom through said exhaust conduit;

said air to fuel ratio control system comprising:

sensor means positioned in said exhaust gas conduit and having a range of response to the level of a gaseous component in the exhaust gas to produce a reference signal which varies between certain limits in a predetermined functional relation with said level;

reset means operatively connected to said air-fuel proportioning device for periodically adjusting the air-to-fuel ratio by an amount sufficient to obtain a first value of said air-to-fuel ratio which first value produces a certain level of said component in the exhaust gas as determined by generation of a certain reference signal between said certain limits by said sensor means; and

positioning means operatively connected to said proportioning device and responsive to said certain reference signal from said sensor means to adjust the air-to-fuel ratio to a second value which deviates from the first value by a selected amount, so that the air-to-fuel ratio is adjusted to said second value by said positioning means whenever

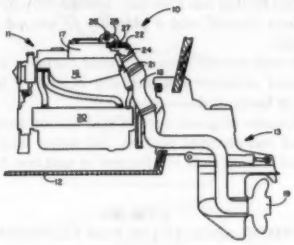
said certain level of gaseous component in the exhaust gas is sensed by said sensor means.

4,526,002

EXHAUST RELIEF SYSTEM

Lawrence C. Bibow, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 27, 1983, Ser. No. 565,422
Int. Cl.[3] F01N 7/12
U.S. Cl. 60—293 5 Claims



1. In a four cycle engine having an intake manifold for supplying air to the engine and an exhaust system for discharging engine exhaust underwater, the improvement comprising:

a vacuum relief means connected to said exhaust system to relieve any vacuum created in said exhaust system, thereby preventing water from entering said engine through said exhaust system, and vacuum relief means including

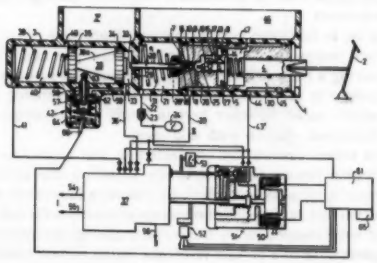
a passageway connecting said intake manifold with said exhaust system and a one-way valve mounted in said passageway allowing flow into said exhaust system.

4,526,003

MASTER BRAKE CYLINDER FOR TWO-CIRCUIT BRAKING SYSTEMS

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 932,099, Aug. 9, 1978, abandoned, which is a continuation of Ser. No. 779,884, Mar. 21, 1977, abandoned. This application Sep. 14, 1983, Ser. No. 532,130
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613219
Int. Cl.[3] B60T 17/22
U.S. Cl. 60—534 3 Claims



1. In a hydraulic brake booster for a vehicle brake system of the type having primary and secondary sides and actuated by a brake pedal and which includes valve means for controlling both the interconnection of a storage source with a pressure alternation chamber in the booster as well as the interconnection of the pressure alternation chamber with a relief station, the booster being connected with a hydraulic dual circuit main cylinder having a return spring biased double piston for pressurizing the primary and secondary sides of the system and which further includes a locking protection device arranged to cooperate with an electronic switching circuit which controls a valve mechanism for controlling the application of hydraulic fluid in the two brake systems, the improvement comprising:

sensing means communicating with said dual circuit main cylinder for indicating an abnormally low braking pressure in one of said braking circuits; and

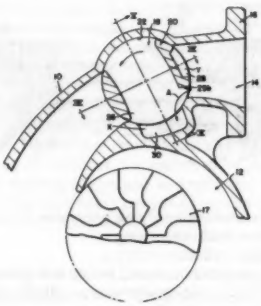
hydraulic means actuated whenever said sensing means detects an abnormally low braking pressure for causing said double piston to execute a series of pumping strokes to raise the pressure to normal in said circuit.

4,526,004

EXHAUST BRAKE VALVE

Pierre B. French, Highburton; David L. Antcliffe, Dalton, both of England, and Gerald L. Donnellan, Columbus, Ind., assignors to Holset Engineering Company Limited, Huddersfield, England

Filed Oct. 25, 1983, Ser. No. 545,317
Int. Cl.[3] F02B 37/00
U.S. Cl. 60—602 10 Claims



1. An exhaust brake valve for use with an internal combustion engine having a divided exhaust manifold and a turbine having a turbine wheel to which separate gas flows can be led from the divided manifold, said valve comprising;

means forming a hollow section of cylindrical configuration having two inlet passages for communicating with the two halves of the divided exhaust manifold and two outlet passages for communication with the two inlet passages of the turbine housing,

means forming a cylindrical rotor closure member having a pair of through passages and journalled for rotation within the cylindrical hollow section for selective positioning between a first position which substantially prevents the flow of gas from the inlet to the outlet passages of the hollow section and a second position which permits free flow of gas between the inlet and outlet passages of the hollow section through said pair of through passages; and,

means for forming at least one interconnecting passage between said inlet passages, said interconnecting passage means being selectively opened in response to the closure member being in said first position, and closed when said closure member is in said second position.

4,526,005

LONG-PERIOD THERMAL STORAGE ACCUMULATORS

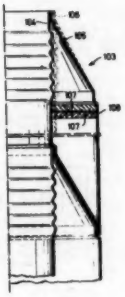
Nikolaus Laing; Ingeborg Laing, and Oliver Laing, all of Hofener Weg 35-37, 7141 Aldingen, Fed. Rep. of Germany

Division of Ser. No. 023,675, Mar. 26, 1979, Pat. No. 4,399,656, which is a division of Ser. No. 860,191, Dec. 15, 1977, Pat. No. 4,174,009, which is a continuation of Ser. No. 616,256, Sep. 24, 1975, abandoned. This application Sep. 30, 1982, Ser. No. 429,053

Claims priority, application Austria, Sep. 30, 1974, 7858/74; Nov. 20, 1974, 9290/74; Apr. 30, 1975, 3312/75

Int. Cl.[3] F01K *3/00*; F28D *1/00*

U.S. Cl. 60—659 5 Claims



1. A long-period heat storage accumulator adapted to contain a large volume of water where the accumulator is for use with a power station and where the accumulator has means for filling and removing water therefrom, the improvement comprising in that said accumulator is contained with a cavern formed from a rock formation whereby the pressure of the water in the accumulator is contained by the rock formation and in that an accumulator wall is spaced from the rock formation with the space between the rock formation and the wall being filled with compressed gas at a pressure equal approximately to the pressure of adjacent hot water.

4,526,006

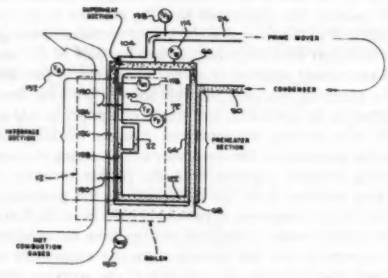
HEAT TRANSFER METHOD AND APPARATUS

George M. Anthony, Eldorado Club, P.O. Box 346, Gardena, Calif. 90247

Filed Nov. 23, 1979, Ser. No. 96,922

Int. Cl.[3] F01K *25/08*; F22B *1/02*

U.S. Cl. 60—671 13 Claims



1. Apparatus for generating power comprising:

means for establishing a heat transfer interface having a first side and a second side;

means for generating heat and applying said heat to said first side;

means for providing a closed working fluid system including means for contacting a working fluid with said second side to receive said heat, means for delivering the resultant heated working fluid to a means for extracting energy from said working fluid, and means for returning said working fluid to said second side; and

means for providing an effective layer of heat distributing fluid normally throughout said interface between said first and second sides, whereby the occurrence of hot spots at said interface is prevented, said heat distributing fluid being present in both a liquid phase and a vapor phase, said heat distributing fluid normally being in the liquid phase at said interface, means for conducting said vapor phase heat distributing fluid toward a heat transfer station, means for withdrawing heat from said heat distributing fluid at said heat transfer station, means for passing said returning working fluid through said heat transfer station to receive the heat withdrawn from said heat distributing fluid at said heat transfer station, means for recycling said heat distributing fluid to said interface.

4,526,007

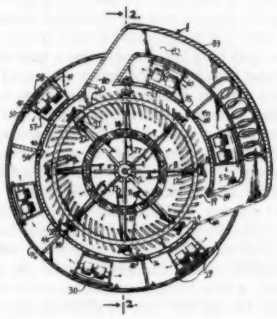
ELECTROMAGNETIC TURBINE SYSTEM

Raymond H. Smith, Rte. 2 - 5AAA, Larned, Kans. 67550

Filed May 19, 1983, Ser. No. 495,959

Int. Cl.[3] F01B *21/04*

U.S. Cl. 60—698 19 Claims



1. An electromagnetic turbine system, which comprises:

(a) an inner casing;

(b) a turbine including turbine blades rotatably mounted in said inner casing;

(c) a turbine magnet mounted on said turbine;

(d) an outer casing at least partly surrounding said inner casing;

(e) air pump means mounted between said inner and outer casings and including:

(1) a pair of electromagnets positioned in opposed relation to each other; and

(2) a piston slidably positioned between said inner and outer casings and connected to at least one of said electromagnets;

(f) discharge and return orifices in said inner casing for communicating air from said air pump means to said turbine blades; and

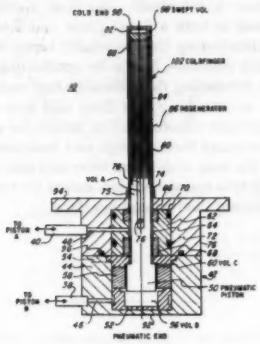
(g) means for selectively energizing at least one of said electromagnets.

4,526,008

PNEUMATICALLY CONTROLLED SPLIT CYCLE COOLER

Carol O. Taylor, Sr., Anna, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 21, 1983, Ser. No. 477,035
Int. Cl.[3] F25B 9/00
U.S. Cl. 62—6 5 Claims



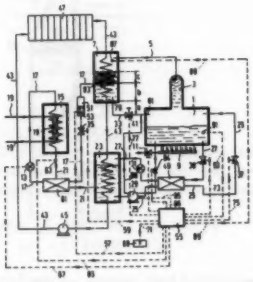
1. A pneumatically controlled split cycle cooler comprising a compressor means including a plurality of selectively spaced pistons for generating a plurality of selectively spaced pressure waves, said plurality of selectively spaced pistons including two pistons spaced from about 30 degrees to 150 degrees apart to produce in phase and out of phase pressure waves, and a cold head means in operative communication with the compressor means for receiving the plurality of pressure waves for controlling the operation of the cold head means and producing a cold spot at a preselected location within the cold head means, said cold head means including a base member having a wall forming a space and a plurality of spaced pneumatic air passages and a collar in open communication with the space, and a tubular member rigidly mounted in said collar; a seal support member mounted in said housing space, said member having interior and exterior surfaces and a pneumatic passage passing through the seal support member, a first plurality of spaced clearance seals mounted on the interior surface of the seal support member, said seals and interior surface forming an elongated, vertically extending recess and a second plurality of spaced seals on the outer surface above and below the pneumatic passage in sealing engagement with the space forming housing wall; a first bumper means mounted in the housing space adjacent to the seal support member, said bumper member having a stop member and an aperture forming wall; a sealing means mounted in the housing adjacent to the first bumper means, said sealing means having an aperture forming wall; a second bumper means having a wall forming a recess, a pneumatic passage to the recess and a stop member; a pneumatic piston means including a piston and an upwardly extending stem, said piston mounted in the apertures of the first bumper and corresponding seal and the recess of the second bumper means for reciprocation between the stop members of the first and second bumper means and said stem extending upwardly through the apertures of the first bumper means, seal support member and into the tubular member attached to the collar of the housing means and having a wall forming a vertically extending well and a horizontal passage in open communication with the well and vertical recess of the seal support means, and a displacer/regenerator rigidly attached to the stem in communication with the stem well whereby cryogenic pressures selectively admitted above and below the piston provides a reciprocating motion to the piston to properly move the displacer/regenerator for forming a cold end at the end of the housing tube.

4,526,009

METHOD OF OPERATING A BIMODAL HEAT PUMP, AS WELL AS BIMODAL HEAT PUMP FOR USING SAID METHOD

Willem L. N. van der Sluys, and Mathias L. Hermans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 456,235, Jan. 7, 1983, abandoned. This application May 15, 1984, Ser. No. 610,356
Claims priority, application Netherlands, Oct. 28, 1982, 8204161
Int. Cl.[3] F25B 15/00
U.S. Cl. 62—101 2 Claims

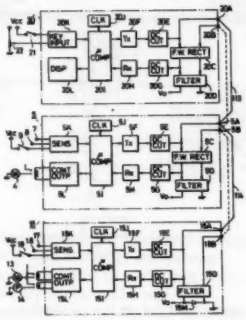


1. A method of operating a bimodal heat pump, said heat pump operating in a first mode as an absorption heat pump and in a second mode as an evaporation-condensation device, which comprises in said first mode heating a generator containing a solution of a working medium in a solvent to separate a part of the dissolved working medium in the gaseous state from the solvent; passing the separated gaseous working medium to a condenser for liquefaction by the giving up of thermal energy to a heat-transport medium, a further quantity of liquid working medium being stored in said condenser; thereafter expanding and evaporating the liquefied working medium in an evaporator by the taking up of thermal energy from the environment; passing the evaporated working medium to an absorber for solution in the solvent while giving up thermal energy to a heat-transport medium; pumping another part of the working medium-solvent solution from the generator to the absorber while pumping working medium-solvent solution from the absorber to the generator; and which comprises in said second mode only passing the separated gaseous working medium from the generator to the condenser and returning the liquefied working medium together with the further quantity of the working medium from the condenser to the generator; and which further comprises, in switching over from the first mode to the second mode, closing the passage from the condenser to the evaporator and the passage from the evaporator to the aborber, discontinuing the pumping of the working medium-solvent solution between the generator and the absorber and between the absorber and the generator, and opening the passage from the condenser to the generator; and which also comprises, in switching back from the second mode to the first mode, opening said closed passages and closing said open passage, the further quantity of the working medium again being stored in the condenser.

4,526,010
SEPARATION TYPE AIR CONDITIONER

Yasuo Sato; Akio Fukushima; Toshiro Kaise, all of Shizuoka; Yoshiyuki Honda, Hyogo; Kazuho Uemura, Hyogo, and Manabu Fujii, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1981, Ser. No. 258,492
Claims priority, application Japan, Apr. 30, 1980, 55-57427; Dec. 2, 1980, 55-170160
Int. Cl.³ F25B *49/00*
U.S. Cl. 62—126 10 Claims



1. A separated-unit type air conditioner having an indoor unit, an outdoor unit and a remote controller unit which are provided at three different positions, the improvement comprising communication means for transmitting information between any two of said units over a two-wire connection, said communication means comprising:

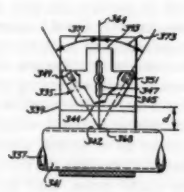
first means at a first of said any two units for transmitting binary data onto said two-wire connection together with a binary second address identifying data transmission to a second of said any two units;

second means at said second unit for inverting said second address to form a first address identifying data transmission to said first unit, for inverting said data to form inverted data and for transmitting said first address and inverted data onto said two-wire connection, said first means comparing said data and inverted data to determine if said data was received correctly at said second unit.

4,526,011
DEW POINT SENSITIVE COMPUTER COOLING SYSTEM

Max C. Logan, Maplewood, and Jon T. Nordstrom, Forrest Lake, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Mar. 3, 1983, Ser. No. 471,953
Int. Cl.³ B21D *28/00*; F25D *17/04*
U.S. Cl. 62—176.1 4 Claims



1. In a cooling system for a computer installed in an environment, a condensation sensor, comprising:

a light source;

a light reflective surface;

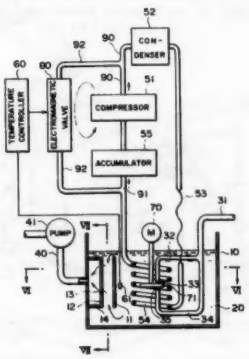
a light detector mounted for receiving light from said light source reflected off of said light reflective surface, said light being fully reflected from said reflective surface to said light detector in dry conditions and only partially reflected from said reflective surface to said light detector in wet conditions wherein water has condensed on said reflective surface; and

circuitry associated with said light detector to distinguish between said fully reflected light and said partially reflected light, said circuitry disabling said coolant system and said computer when said light is only partially reflected due to condensation on said reflected surface.

4,526,012
LIQUID TEMPERATURE REGULATOR

Junji Chigira, Maebashi, Japan, assignor to Kanto Seiki Kabushiki Kaisha, Japan

Filed Sep. 27, 1983, Ser. No. 536,359
Claims priority, application Japan, Sep. 29, 1982, 57-170280; Jan. 31, 1983, 58-15215
Int. Cl.³ F25B *41/00*; F25D *17/02*
U.S. Cl. 62—196.3 14 Claims



1. A liquid temperature regulator comprising:

a liquid tank for containing liquid whose temperature is to be controlled;

attenuation chamber means for attenuating the amplitude and the high frequency component of a temperature waveform of liquid passing through said attenuation chamber means;

means including an inlet line for feeding liquid into said liquid tank;

means for feeding liquid into said attenuation chamber means from said tank;

means including an outlet line for feeding liquid out of said attenuation chamber means; and

refrigeration apparatus including:

a compressor for compressing a refrigerant, a condenser connected to said compressor to liquefy the compressed refrigerant, and an evaporator in said tank connected to said condenser to evaporate the liquefied refrigerant and connected to said compressor to return the evaporated refrigerant thereto, thereby cooling the liquid within said liquid tank;

means for detecting the temperature of the liquid in said liquid tank;

a by-pass path for said compressor; and

control means for controlling said by-pass path in such manner that when said temperature detecting means detects a liquid temperature higher than a predetermined value, said control means closes said by-pass path, and when said temperature detecting means detects a liquid

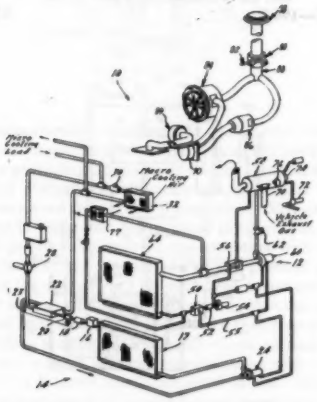
temperature lower than a predetermined value, said control means opens said by-pass path.

4,526,013

ENVIRONMENTAL PROTECTION SYSTEM

John R. Joy, Brighton, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Oct. 18, 1982, Ser. No. 434,857
Int. Cl.³ F25B 27/00, 27/02
U.S. Cl. 62—236 1 Claim



1. An environmental conditioning system for a vehicle having an internal combustion engine with an exhaust outlet comprising:

a closed Flourinal 85 power and heating circuit including a vapor generator for the vaporization of Fluorinal 85 by the combustion of a fuel and by heat exchange from the internal combustion engine exhaust, selectively, a turboalternator connected to said vapor generator and driven by said Flourinal 85 for the production of alternating current, a regenerator connected to the exhaust side of said turboalternator, a condenser connected to said regenerator, and a Fluorinal 85 reservoir connected between said condenser and vapor generator including a conduit passing through said regenerator,

a closed Freon 113 cooling circuit including an electric motor driven by alternating current from said turboalternator, a compressor for said Freon 113 driven by said electric motor, a condenser connected to said compressor, an expansion valve connected to said condenser, and a dual purpose evaporator and heat exchanger connected between said expansion valve and said compressor, and

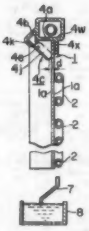
a closed ethylene-glycol-water cooling circuit comprising the heat exchanger portion of said dual purpose evaporator and heat exchanger, a pump connected to said evaporator, valve means connected to said pump for controlling flow of the etheylene-glycol-water in said cooling circuit, and a heat exchanger connected between said valve and said evaporator.

4,526,014

WATER SPRAY UNIT FOR ICE PRODUCT MAKING MACHINE

Tomio Suyama, Toyoake, and Kazuya Osawa, Nagoya, both of Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Oct. 16, 1984, Ser. No. 661,325
Claims priority, application Japan, Oct. 18, 1983, 58-193422; Oct. 18, 1983, 58-193423
Int. Cl.³ F25C 1/12
U.S. Cl. 62—347 10 Claims



8. A water spray unit for an ice product making machine or apparatus, said spray unit comprising a pair of freezing plates facing to each other on both sides of an evaporator of the refrigerating system, said freezing plates each having a plurality of guide ribs or projections extending vertically and spaced apart transversely at a preset distance from one the other, characterized in that the spray unit comprises further

a main body of the spray unit in the form of a transversely elongated box or casing having a bottom wall portion and two exterior side wall portions contiguous to one another via two bottom side corners and said bottom wall portion, with a pair of substantially L-shaped holding plates extending from said exterior side wall portions with the terminal end parts thereof directing inwardly and towards each other, said bottom wall portion presenting a number of longitudinally spaced apart spray apertures and with a plurality of holding lugs extending from the exterior surface of said bottom wall portion and into the space defined between the upper extreme ends of said freezing plates, and

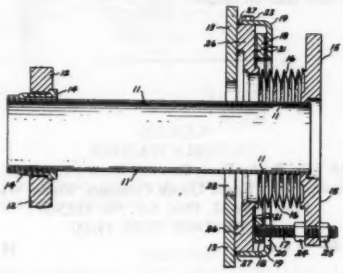
a plurality of water spray guide plates mounted intermediate the exterior side wall portions of the main body of the spray unit and said freezing plates and introduced between the adjoining ones of the guide projections,

said water spray guide units each having a main portion and a pair of upright side flanges extending parallel to said guide projections from the side edges of said main portion, said upright flanges each having a notch substantially corresponding in configuration to the bottom side corner of said main body of the spray unit, said water spray guide plates being held in position by said main body of the spray unit by engagement of said L-shaped holding plates and the bottom side corners with the water spray guide plates, with the upright side flanges of the water spray guide plates abutting on the freezing sides or surfaces of said freezing plates by the downstream side terminal end portions thereof relative to the downfall direction of the ice-making water so as to delimit a preset interstice between the freezing surfaces and the lower extreme ends of the water spray guide plates, said upright side flanges cooperating with the holding lugs for clamping said main body of the water spray unit into said freezing plates for setting the fixed position of said main body of the water spray unit on said freezing plates.

4,526,015
SUPPORT FOR CRYOSTAT PENETRATION TUBE

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 15, 1984, Ser. No. 661,013
Int. Cl.³ F25B 19/00
U.S. Cl. 62—514 R 12 Claims



1. A penetration assembly for a cryostat having an inner wall and an outer wall, said assembly comprising:

a penetration tube affixed to said inner wall and extending through an aperture in said outer wall;

an outer flange affixed to the exterior end of said penetration tube;

an air tight bellows affixed to and extending from said outer flange toward said outer wall, said bellows also being affixed relative to said outer cryostat wall so as to surround said aperture;

a washer-shaped bearing through which said penetration tube is disposed, said bearing being disposed between said outer wall and said flange;

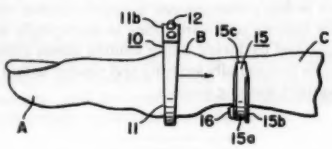
means to hold said bearing so as to restrict its permissible motions to those lying in a plane substantially parallel to said outer wall; and

means to affix said outer flange to said bearing.

4,526,016
RING AND SINGING DEVICE WITH PUSH TAB

Richard S. Cercone, 200 Dombey Dr., Pittsburgh, Pa. 15237

Filed Aug. 1, 1983, Ser. No. 519,362
Int. Cl.³ A44C 9/02
U.S. Cl. 63—15.6 2 Claims

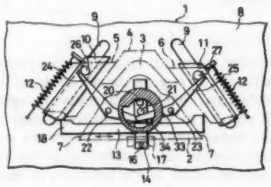


1. An improved ring sizing assembly of a quickly and fully separable construction for use by a wearer in retaining a ring on his or her finger phalanx which comprises, a substantially circular ring shank of a larger than a desired wearing size that is to be slid over a finger knuckle for mounting on the finger phalanx, a substantially semi-circular size-reducing bridge part that is easily insertable and completely removable from a secure frictional fitting relation within said ring shank by the wearer from a finger phalanx wearing position therein by manual pushing in-and-out force applied thereto, said bridge part having a connecting back portion and a pair of opposed prong portions of a shape and size to be frictionally secured in alignment within an encircling back portion of said ring shank, said bridge part having means including flange portions along one side face thereof of a diameter larger than the inside diameter of an inner receiving portion of said ring shank to limit insertion and removal of said bridge part from the one side face of the ring shank and to provide it with a mounted positioning within said ring shank, a push tab projecting outwardly from an opposite side face of said bridge part substantially centrally of its said connecting back portion and also projecting outwardly beyond an adjacent side of said ring shank when said bridge part is in a fully mounted position therein, said bridge part being adapted to be pushed by an application of manual pressure force applied to said flange portions of its one side face into an inside-mounted size-reducing relation within substantially a back half of said ring shank after said ring shank has been slid over the knuckle to the finger phalanx, and said bridge part being adapted to be removed from and out of its size-reducing mounted position within said ring shank by an application of manual pressure force to said push tab when said ring shank is to be slid off the wearer's finger.

4,526,017
KNITTING DENSITY ADJUSTING METHOD

Masahiro Shima, Wakayama, Japan, assignor to Shima Idea Center Co., Ltd., Wakayama, Japan

Filed Dec. 8, 1983, Ser. No. 559,475
Claims priority, application Japan, Dec. 11, 1982, 57-217251
Int. Cl.³ D04B 7/00
U.S. Cl. 66—71 6 Claims



1. A knitting density adjusting method, comprising the steps of

feeding a reference length of yarn as a reference course to needles of a reference section disposed on a needle bed;

comparing a knitting yarn length used in said reference section, to said reference yarn length, in a subsequent knitting operation;

actuating a knitting density drive unit to raise a knitting cam when said knitting yarn length is shorter than said reference yarn length to increase knitting density;

actuating said knitting density drive unit to lower said knitting cam when said knitting yarn length is longer than said reference yarn length to decrease knitting density; and

continuing the comparing of said reference yarn length and said knitting yarn length until both become coincident.

4,526,018
KNITTING CAM UNIT AND TRANSFER CAM UNIT COMBINATION FOR V-BED FLAT KNITTING MACHINES WITH SLIDER NEEDLES

Gottfried Kühnert, Aalen, and Albert Lutz, Westhausen, both of Fed. Rep. of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Westhausen, Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 497,453
Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3220049
Int. Cl.³ D04B 7/00
U.S. Cl. 66—78 5 Claims

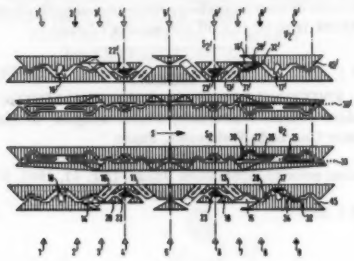
1. A knitting cam unit and transfer cam unit combination for V-bed flat knitting machines, wherein needle butts of the needle bodies of slider needles are selectively lowerable in the

needle channels of the needle beds by means of a needle selection device wherein stationary and movable cam elements are provided for engagement with the needle butts and the slider butts, and wherein pressure cam elements are provided cooperating with the needle selection device, in which

(a) at least one pure knitting cam unit and a leading and trailing pure transfer cam unit are provided,

(b) cam channels for the needle butts and the slider butts are defined by the respective cam units, each channel being symmetrical with respect to the central transverse axis of each cam unit,

(c) each knitting cam unit comprises a symmetrical cam element arranged to strike the needle butts for the formation of stitches, the or each said cam element being tiltable into operation in the leading sense at the positions of carriage reversal,



(d) each transfer cam unit comprises a symmetrical cam element arranged to engage the needle butts for the donation of stitches and two cam elements arranged symmetrically with respect to said symmetrical cam element and arranged to engage the needle butts for the acceptance of stitches, wherein the cam elements adjacent to the respective knitting cam units, at the positions of carriage reversal, are movable out of operation when trailing the knitting cam unit and are movable into operation when leading the knitting cam unit,

(e) for each knitting cam unit there are two selection positions for the needle butts for the formation of stitches, and, at the central transverse axis, one selection position for the needle butts for the formation of tuck loops, and

(f) for each transfer cam unit there are two selection positions for the needle butts for the donation of stitches or for the acceptance of stitches.

4,526,019

YARN FEED MECHANISM

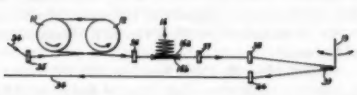
Max W. Betts, Falmouth, England; Nigel Johnson, deceased, late of Ripley, England; by Ernest W. Bennett, and by Joyce H. Bennett, executors, both of Belper, England, assignors to Courtaulds Plc, Derbyshire, England

Filed Sep. 8, 1983, Ser. No. 530,347

Claims priority, application United Kingdom, Sep. 14, 1982, 8226117

Int. Cl.³ D04B *15/48*

U.S. Cl. 66—132 R **6 Claims**



1. A yarn feed mechanism for a knitting machine, comprising:

(a) power operated yarn feed means for feeding yarn at a speed greater than the maximum speed at which yarn is taken up by the needles of the knitting machine, and control-responsive to tension in the yarn leaving said yarn feed means,

(b) yarn take-up means for rapid take-up of excess yarn, and

(c) yarn restraining means arranged on a yarn path between said feed means and said yarn take-up means for restraining removal of yarn from said feed means by sole action of the yarn take-up means.

4,526,020

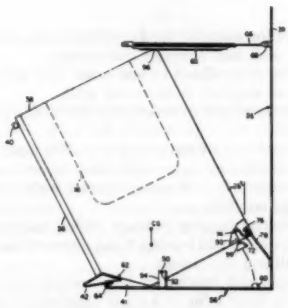
TILTABLE WASHER

Robert M. Fey, Rocky Face, Ga., and Ronald L. Altnau, Ripon, Wis., assignors to Speed Queen Company, Ripon, Wis.

Filed May 31, 1984, Ser. No. 615,968

Int. Cl.³ D06F *29/02, 39/00*

U.S. Cl. 68—3 R **14 Claims**



1. In combination:

a stable base;

a top loading clothes washer pivotally supported on said base wherein said washer is tiltable between an upright washing position and a predetermined forward tilting position used for loading and unloading clothes;

means for limiting said forward tilting at said predetermined forward position, said forward tilting limiting means comprising a hook connected to said base which engages said washer in said predetermined forward position; and

means for limiting backward tilting at said upright washing position, said backward tilting limiting means comprising means for horizontally securing said washer to said base in said upright washing position.

4,526,021

SPARE TIRE LOCK

William E. Princell, 10803 Wildwood Dr., Indianapolis, Ind. 46256

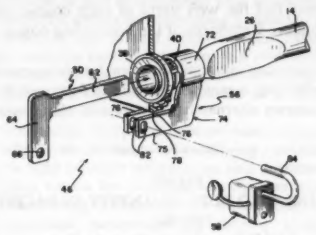
Filed Aug. 1, 1983, Ser. No. 519,140

Int. Cl.³ G05G *5/00*; E05B *65/12*

U.S. Cl. 70—183 **8 Claims**

1. In a vehicle spare tire elevator mechanism having a hollow drive shaft, means for operatively coupling the drive shaft to the tire, and a relatively stationary vehicle member adjacent the drive shaft, a locking mechanism for selectively preventing operation of the elevator mechanism comprising a first bracket having a first portion for being removably received in the

hollow drive shaft and being non-rotatable with respect to the drive shaft, and means for locking the first bracket to the



relatively stationary vehicle member for preventing operation of the elevator mechanism.

4,526,022

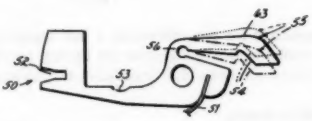
KEYLOCK WITH RESETTABLE, BENDABLE LEVER TUMBLERS

Joseph J. Parrock, Milford, Ohio, assignor to American Standard Inc., New York, N.Y.

Continuation-in-part of Ser. No. 449,378, Dec. 13, 1982,. This application Jan. 21, 1983, Ser. No. 459,657

Int. Cl.³ E05B *35/12, 25/00*

U.S. Cl. 70—339 **11 Claims**



1. In a lock having at least one key settable lever tumbler of the type wherein the position of an operating key-engaging edge of the tumbler can be set relative to a gate in the tumbler by turning an operating key to bend a bendable portion of the tumbler in a first direction from an initial configuration to a set configuration;

the improvement comprising,

a change key and means presented in said lock for receiving and journaling said change key in such position that the change key can be turned to engage a change key-engaging edge of the tumbler, the change key being configured to rebend the bendable portion of the tumbler in the direction opposite to the first direction, and to overbend said bendable portion sufficiently beyond said initial configuration that when the change key is disengaged from the tumbler said bendable portion springs back in the first direction until the operating key-engaging edge substantially returns to said initial configuration.

4,526,023

TUBE FLARING TOOL DIE ASSEMBLY

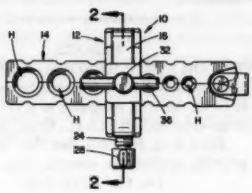
Larry F. Babb, LaGrange, Ohio, assignor to Emerson Electric Company, St. Louis, Mo.

Filed Nov. 23, 1983, Ser. No. 554,539

Int. Cl.³ B21D *41/02*

U.S. Cl. 72—116 **15 Claims**

1. A tube flaring tool flare bar assembly comprising a pair of elongate parallel flare bars having opposite ends, laterally opposed inner sides, coplanar upper sides and coplanar lower sides, said flare bars being laterally pivotal relative to one another about an axis at a common one of said opposite ends and between open and closed positions, said axis being transverse to the planes of said upper and lower sides, recesses in said opposed inner sides cooperable to support a tube to be flared when said flare bars are in said closed position, and resilient retaining means, said retaining means interengaging said flare bars at said one of said opposite ends to alone support



said flare bars with said upper and lower sides coplanar and for pivotal movement of said flare bars relative to one another about said axis between said open and closed positions.

4,526,024

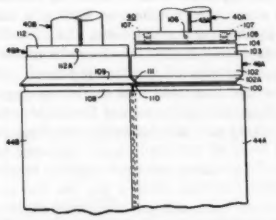
APPARATUS FOR FORMING ELONGATED SHEET METAL PANELS

Andrew J. Toti, 311 W. River Rd., Modesto, Calif. 95351

Filed Jul. 9, 1982, Ser. No. 396,609

Int. Cl.³ B21B *1/08, 27/02;* **B21D** *13/04*

U.S. Cl. 72—177 **10 Claims**



1. Apparatus for forming an elongated sheet metal panel defined by a first portion including a major central portion having transverse corrugations formed therein, a transition portion adjacent said first portion and at least one marginal edge portion which has a configuration is either uncorrugated or has longitudinal corrugations or relatively light transverse corrugations therein with said transmission portion and said edge portion having substantially the same overall length as said first portion; said apparatus comprising a corrugation roll assembly receiving a flat sheet metal panel, a tension roll assembly downstream of said corrugation roll assembly for receiving said sheet metal panel after passing through said corrugation roll assembly, and power transmitting means for simultaneously driving said corrugation roll assembly at a first rotational velocity and said tension roll assembly at a second higher rotational velocity to provide a pulling force on said sheet metal panel between said corrugation roll assembly and said tension roll assembly, said corrugation roll assembly including first and second rotationally mounted shafts, first and second corrugation roll sections carried in interengaged manner on respective ones of said shafts and receiving said first portion of said panel for forming said transverse corrugations therein, and at least one edge roll subassembly carried on said shafts at one end of said corrugation roll sections, said edge roll subassembly including first and second edge rolls carried on said first and second shafts and having matching circumferential surface portions oriented at a substantial angle to the plane of said central panel section passing through said corrugation rolls and defining an angled panel receiving channel therebetween, and resilient mounting means for urging said edge rolls resiliently toward each other in a direction along the axis of a corresponding shaft to hold said portion of said edge panel section therebetween and thereby to cause an inward drawing

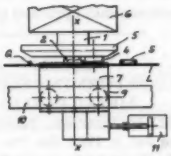
of metal from said held portion of said edge panel section into said corrugated panel section for equalizing the overall lengths of said sections.

4,526,025

WIRE OR STRIP BENDING MECHANISM

Klaus Ritter; Gerhard Ritter; Gerhard Schmidt, and Josef Ritter, all of Graz, Austria, assignors to EVG Entwicklungs- und Verwertungs-Gesellschaft m.b.H., Graz, Austria

Filed Aug. 18, 1983, Ser. No. 524,299
Claims priority, application Austria, Aug. 23, 1982, 3190/82
Int. Cl.³ B21D *9/05*
U.S. Cl. 72—388 **7 Claims**



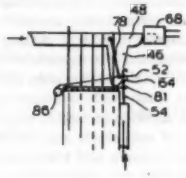
1. A bending mechanism for bending material in the form of wire or strip, said mechanism having a substantially right circular cylindrical bending form, and a bending-tool mounted on a rotatable tool carrier which can be rotated in either direction about the axis of the bending-form, said bending-form having an end face, said tool carrier having an end face and said bending tool having an end face, said bending-form being shiftable along said axis between a working position in which said end faces of said tool carrier and said bending-form are substantially touching and a rest position in which said two end faces define between them a gap for the passage of a wire which is to be bent, said gap being only slightly larger than the thickness of the wire to bent the bending tool being eccentrically mounted on said tool carrier with respect to said axis, and said bending-tool end face being substantially coplanar with said end face of said bending-form in said rest position of said bending form.

4,526,026

METHOD AND APPARATUS OF PRODUCING CONTINUOUS THREE-DIMENSIONAL FABRICS

Konrad, L. Krauland, Jr., 5 Sheffield, La., Pottstown, Pa. 19464

Filed Apr. 11, 1984, Ser. No. 599,254
Int. Cl.³ D04B *35/00*
U.S. Cl. 66—1 R **9 Claims**



1. A device for forming a three-dimensional fabric having warp yarns arranged in an array of rows and columns comprising:

a forming bed;

first means for pushing a first set of weft yarns along said rows from a first to a second position and back to said first position to form a first course across said forming bed;

second means for pushing a second set of weft yarns along said columns from a third to a fourth position and back to said third position;

means for interlocking longitudinally second courses across said former bed the weft yarns of each course with the corresponding weft-yarns of the preceeding course of the same set; and

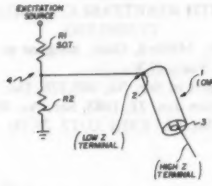
means for operating said first and second pushing means, and said interlocking means sequentially to form said first and second courses alternately transversally along said warp yarns.

4,526,027

PRE-CALIBRATED FUEL QUANTITY CAPACITIVE PROBE

Cecil Franklin, Middlebury, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Nov. 23, 1983, Ser. No. 554,649
Int. Cl.³ G01F *25/00*
U.S. Cl. 73—1 H **3 Claims**



1. An apparatus for pre-calibrating a fuel quantity capacitance-type probe before operational use thereof having a low impedence electrode and a high impedance electrode, comprising

an excitation source,

a voltage divider means connected to said excitation source and said low impedance electrode, and

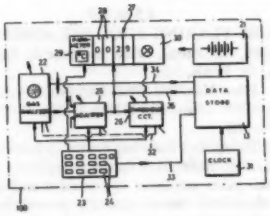
said voltage divider having a first fixed value resistor and a second resistor whose value is selected to effect the dry value of said probe within a small tolerance of approximately 1% above a given design value of capacitance for said probe.

4,526,028

PROCESS AND DEVICE FOR INDICATING AND EVALUATING ENVIRONMENTAL PARAMETERS

Hans J. Hübner, Katthagen 24, 4400 Münster, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,696
Claims priority, application Fed. Rep. of Germany, May 12, 1982, 3217798
Int. Cl.³ G01N *31/00*
U.S. Cl. 73—23 **11 Claims**



1. A device for gathering information on enviromental conditions, comprising:

a portable base;

measuring means on said base for detecting the magnitudes of selected environmental parameters;

chronometric means on said base;

storage means on said base coupled with said measuring and chronometric means for registering a detected magnitude of a selected one of said environmental parameters together with the time of detection on a recording medium;

coding means on said base for additionally registering on said recording medium the location of a device at the instant of said detection; and

adjustment means interposed between said measuring means and said threshold means for modifying a detected magnitude in light of other information, said adjustment means including means for selecting among parameter-specific items modifying information for a particular one of said environmental parameters and thereby modifying the detected magnitude with the selected information and for changing said items among which selection is made.

4,526,029

PARTICLE SIZE ANALYSIS

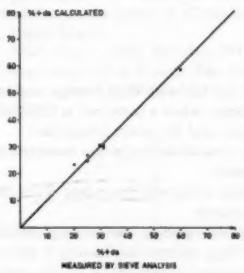
Peter E. Starnes, Slough, England, assignor to Bestobell (U.K.) Limited, Great Britain

Filed Apr. 3, 1984, Ser. No. 596,307

Claims priority, application United Kingdom, Apr. 11, 1983, 8309716

Int. Cl.³ G01N *15/02*

U.S. Cl. 73—61 R **9 Claims**



1. A method of monitoring the fineness of solids in a first suspension of solids in a liquid medium flowing under constant head of constant pressure conditions, the method comprising applying a force field to said first suspension; separating said first suspension under the influence of said force field into two flowing second suspensions containing respectively solids generally coarser than and generally finer than a predetermined separation size; measuring the density of said first suspension and the density of at least one of said second suspensions; and determining from said measured densities said fineness of said solids in said first suspension.

4,526,030

MULTI-FUNCTIONAL TIRE TESTING TOOL

Guy L. Vecera, Jr., 1625 Chester Blvd., Richmond, Ind. 47374

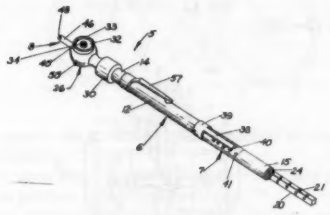
Filed May 18, 1983, Ser. No. 495,838

Int. Cl.³ B60C *23/02*

U.S. Cl. 73—146.8 **9 Claims**

1. An improved conventional tire gauge of the type having an elongated cylindrical body and a hollow interior, the cylindrical body having a top and a bottom end, a pressure indicator slide bar being telescopically located within the hollow interior through the bottom end of the cylindrical body, a tire valve engaging head being attached to the top end of the cylindrical body, a cup and spring mechanism coacting within the hollow interior of the cylindrical body for communication between the tire valve engaging head and the pressure indicating slide bar, a bottom guide having an opening fitting into the bottom end of the cylindrical body for guiding the pressure indicator slide bar in and out of the hollow interior of the cylindrical body, wherein the improvement comprises

(a) a tire tread depth checker positioned on the bottom end of the cylindrical body, the tire tread depth checker having an indicator probe positionable between the tire treads, the indicator probe slidably engaging the cylindrical body, a linear scale on the cylindrical body cooperating with the indicator probe to provide a measurement of the tire tread thickness;



(b) an element for removing a conventional tire stem core of the type having a pin and a shoulder, a stem core removing element attached to the tire valve engaging head and having a free end, the stem core removing element comprising a rod like element with an internal axial bore for receiving the tire stem pin, the bore having a slot extending across the bore opening at the free end of the rod like element for engaging the tire stem shoulder, whereby a multi-functional tire tester is provided capable of measuring tire pressure and tread depth and removing and replacing a tire stem core.

4,526,031

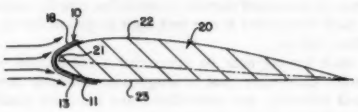
METHOD AND APPARATUS FOR PROGNOSTICATING POTENTIAL ICE ACCUMULATION ON A SURFACE EXPOSED TO IMPACT ICING

Norbert A. Weisend, Jr., Cuyahoga Falls, and William A. Beard, Jr., Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 10, 1983, Ser. No. 456,675

Int. Cl.³ G01M *9/00*

U.S. Cl. 73—147 **9 Claims**



6. A method for measuring water vapor droplet impingement on a substantially continuous surface exposed to an airflow field in which water vapor droplets are entrained comprising the steps of:

bonding a water soluble gelatin coating to a substrate;

removably adhering said substrate to the surface so as to present said gelatin coating along the surface;

exposing the surface and gelatin coating adhered thereon to the airflow field for a measured period of time in order to allow droplets entrained in the airflow field the opportunity to impact upon the gelatin coating, thereby creating an impingement mark;

removing the substrate and attached gelatin coating from the surface;

subjecting the gelatin coating to microscopic observation to determine the size, location and concentration of droplet impingements thereon.

4,526,032

INSTALLATION FOR MEASURING LIQUID QUANTITIES

Bernhard Hüster, Borchen, Fed. Rep. of Germany, assignor to Deutsche Geratebau GmbH, Salzkotten, Fed. Rep. of Germany

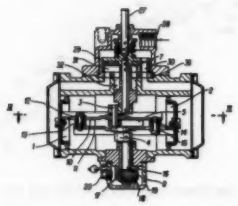
PCT No. PCT/DE82/00161, § 371 Date May 12, 1983, § 102(e) Date May 12, 1983, PCT Pub. No. WO83/01108, PCT Pub. Date Mar. 31, 1983

PCT Filed Aug. 5, 1982, Ser. No. 499,170

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1981, 3136387

Int. Cl.[3] G01F *3/18*

U.S. Cl. 73—245 3 Claims



1. Apparatus for measuring quantities of flowing liquid, of the type comprising a housing that defines cylinders, a piston for each said cylinder that is reciprocatingly displaceable in its cylinder by liquid flowing through the housing, and a crankshaft connected with the pistons to be rotated by their displacement so that the number of revolutions made by the crankshaft is dependent upon quantity of liquid flowing through the housing, said apparatus being characterized by:

A. said crankshaft comprising two shaft parts, each having an axis,

(1) one of which rotates on a fixed axis with which its axis coincides,

(2) the other of which is axially spaced from said one shaft part, and

(3) each of which carries on eccentric crankpin, said crankpins being on the adjacent ends of said shaft parts and each crankpin projecting away from the shaft part that carries it;

B. said housing providing a pair of said cylinders which are substantially opposite one another and the pistons of which are at opposite sides of said fixed axis;

C. a pair of elongated parallel cross-slides, one for each piston,

(1) each connected at one end with its piston for reciprocation with it,

(2) each having near its other end a connection with the other cross-slide that is lengthwise slideable therealong and whereby the cross-slides are mutually confined to lengthwise reciprocation, and

(3) each having a transverse slot in which a crankpin is engaged, each crankpin cooperating with one of the cross-slides to translate reciprocation of that cross-slide into rotation of the shaft part which carries that crankpin;

D. a guide disc between the adjacent ends of the shaft parts to which said crankpins are connected at locations thereon that define an acute angle having its apex at said fixed axis and whereby the shaft parts are constrained to rotate in unison; and

E. an eccentric sleeve wherein said other shaft part is carried with its axis spaced from and parallel to said fixed axis, said sleeve having an axis which coincides with said fixed axis and being rotatable in the housing about that axis, said sleeve being normally constrained to rotate with said other shaft part but being adjustably rotatable relative to said other shaft part for adjusting the distance between its crankpin and said fixed axis and thereby adjusting the stroke of one of said pistons.

4,526,033

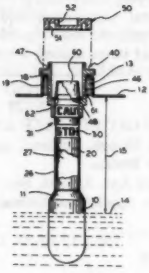
FILL GAUGE FOR SAFETY AND WASTE DISPOSAL DRUMS

Frank S. Flider, Mattoon, Ill., assignor to Justrite Manufacturing Company, Chicago, Ill.

Filed Sep. 19, 1983, Ser. No. 533,593

Int. Cl.[3] G01F *23/06*

U.S. Cl. 73—322 9 Claims



1. A fill gauge for use with fluid storage and transportation containers to indicate when a container is filled or nearly filled with fluid, wherein said fill gauge comprises:

a substantially vertical sliding piston mounted in an opening in the container;

a float, said float integrally extending from the bottom of said sliding piston;

collar means surrounding said sliding piston, said collar means defining an opening having a smooth inner surface conforming substantially to the outer surface of said sliding piston whereby said sliding piston may slide substantially unimpaired therethrough,

said collar means further comprising means for removably attaching said collar means to the opening in the top of said container;

first restraining means at the bottom of said sliding piston to prevent said sliding piston from passing completely through said collar means in an upward direction;

second restraining means at the top of said sliding piston to prevent said sliding piston from passing completely through said collar means in a downward direction, the top of said sliding piston including a removable cap;

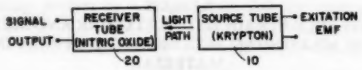
said second restraining means including a flange of a maximum circumference greater than the circumference of said sliding piston, and greater than the inner circumference of said collar means, the top portion of said sliding piston having a maximum circumference less than or equal to the inner circumference of said collar means, and

one or more indicia, said indicia located on said sliding piston which may be passed through said collar means whereby said indicia become progressivly visible above said collar means as said sliding piston is lifted through said collar in response to buoyant forces acting upon said float as the upper level of said fluid in said container buoyantly contacts said float when said fluid becomes progressively proximate to said top of said container and flange.

4,526,034
KRYPTON HYGROMETER

Gaylon S. Campbell, Pullman, Wash.; Bertrand D. Tanner, Mendon, Utah, and Robert V. Gauthier, Rocky Hill, N.J., assignors to Campbell Scientific, Inc., Logan, Utah

Filed May 7, 1984, Ser. No. 607,750
Int. Cl.[3] G01W *1/00*; G01N *27/62*
U.S. Cl. 73—336.5 6 Claims



1. In a hygrometer for measurement of water vapor density by the absorption of ultraviolet radiation, the apparatus comprising:

a krypton-filled glow dischargé tube;

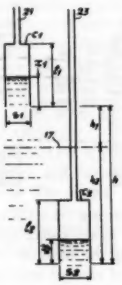
detector tube means for receiving radiation along a path leading from the glow discharge tube; and

a gaseous sample path intersecting the path leading from the glow discharge tube to said detector tube means.

4,526,035
DEVICE FOR MEASURING A PRESSURE DIFFERENCE WITHIN A PULSED COLUMN

Pierre Auchapt, Bagnols-sur Cèze, and Daniel Mathieu, Avignon, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 3, 1982, Ser. No. 384,473
Claims priority, application France, Jun. 3, 1981, 81 10985
Int. Cl.[3] G01F *23/16*
U.S. Cl. 73—439 11 Claims

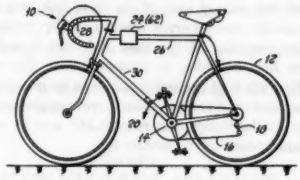


1. A device for measuring the pressure difference between two points P_1 and P_2 within a pulsed column comprising first and second dipping tubes issuing respectively into the column at the levels of points P_1 and P_2, means for introducing into each of said dipping tubes a gas and for bubbling it into the liquid medium of the column and means for determining the pressure difference between said dipping tubes, wherein the first and second dipping tubes issue respectively into the column via cavities C_1 and C_2, which are open at their lower end, said cavities C_1 and C_2 having dimensions such that when pressure variations occur due to the pulsation, the gas-liquid interface is always located in each of the said cavities and the variation of the gas-liquid interface level in cavity C_1 and the variation Δx_2 of the level of the gas-liquid interface in cavity C_2 are such that $\Delta x_1/\Delta x_2$ remains substantially equal to ρ_2/ρ_1,ρ_2 and ρ_1 representing respectively the density of the liquid medium present in the column level with point P_1 and the density of the liquid medium in the column level with point P_2.

4,526,036
CADENCE METER

Thomas R. Morrison, 137 Overlook St., Mount Vernon, N.Y. 10550

Filed Dec. 30, 1983, Ser. No. 405,327
Int. Cl.[3] G01P *15/00*
U.S. Cl. 73—493 15 Claims



1. A cadence meter for an object propelled by a pulsating force, comprising:

means for measuring acceleration produced by said pulsating force to produce an acceleration signal;

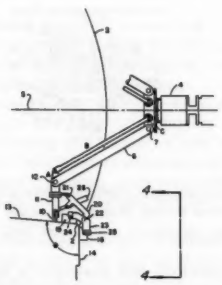
means for measuring the elapsed time between successive occurrences of a predetermined condition of said acceleration signal; and

means based on said elapsed time for measuring a cadence of said pulsating force.

4,526,037
NOZZLE INNER RADIUS INSPECTION SYSTEM

Timothy H. Wentzell, South Windsor, Conn., and Zoran Kuljis, Zagreb, Yugoslavia, assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 13, 1983, Ser. No. 503,978
Int. Cl.[3] G01N *29/04*; G21C *17/00*
U.S. Cl. 73—640 6 Claims



1. A nondestructive inspection apparatus for the inner radius lip of a nuclear reactor vessel nozzle which apparatus includes a boom hub whose axis coincides with the centerline of the nozzle and is adapted to rotate about and horizontally translate along the nozzle axis, including,

a first elongated arm pivoted by its first end from the forward end of the boom hub,

a roller connected to the second end of the elongated arm which is pivoted from the hub to engage the roller with the cylindrical internal surface of the nozzle as the boom hub is rotated in a sweep about the centerline and translated along the centerline,

an elongated base link pivoted by its first end relative to the second end of the arm,

a transmitter of ultrasonic sound connected to the second end of the base link adapted to move over and direct

ultrasonic sound through the inner radius nozzle lip toward the interior of the reactor vessel,

a receiver of the sound from the transmitter connected to the base link and positioned to move over the nozzle surface which forms the inner radius with the internal nozzle surface,

and a means connected between the base link and the elongated arm arranged to generate a force on the base link to rotate the second end of the base link and the attached transmitter and receiver toward the lip surfaces,

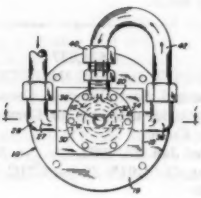
whereby pivoting of the base link and translation of the boom hub combine to accommodate the saddle shape configuration of the inner radius in maintaining the transmitter and receiver a constant average distance from each other as the boom hub rotates the arm in sweeping the circumference of the nozzle lip.

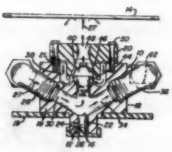
4,526,038

CROSS-FLOW ULTRASONIC TRANSDUCER HEAD

William A. Box, Bethel Park, and Eugene R. Rusiecki, Monroeville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 13, 1984, Ser. No. 579,630
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—644 **5 Claims**





1. In ultrasonic testing equipment, apparatus for forming and flowing a uniform stream of coupling liquid between a piezoelectric crystal transducer and a test body, said apparatus comprising:

(a) a housing mounting said transducer at an end thereof remote from said test body and providing a substantially straight axial longitudinal flow passage from said transducer and having a discharge path directed toward said body;

(b) a first transverse passageway in said housing radially intersecting said axial longitudinal passageway adjacent said transducer, said first passageway being configured to angularly direct said liquid in sweeping relation to the operative end of said transducer;

(c) a second transverse passageway in said housing radially opposite from said first transverse passageway and intersecting said first passageway adjacent the operative end of said transducer, said second passageway being configured to divert said fluid angularly away from the operative end of said transducer to produce an area of increased pressure at said operative end of said transducer so as to suppress the generation of bubbles on said surface;

(d) a toroidal chamber in said housing surrounding said axial longitudinal flow passage between the end of said housing adjacent said test body and said transducer, said toroidal chamber having an inlet on one side of said body and an inwardly directed radial outlet;

(e) a converging cavity in said housing disposed about said axial longitudinal passageway and operative to combine the flows from the outlet of said toroidal chamber and from said longitudinal passageway; and,

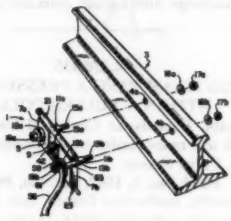
(f) a conduit to direct said fluid between said second transverse passageway and the inlet of said toroidal chamber.

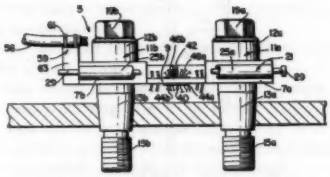
4,526,039

REMOVABLE STRAIN GAUGE FIXTURE AND METHOD FOR MEASURING ACCUMULATED STRAIN IN A MATERIAL

Harry Ceccon, Boston; Richard A. Murphy, North Abington; H. David Reed, Carlisle, and Oscar Orringer, Duxbury, all of Mass., assignors to The United States of America as represented by the Secretary of Transportation, Washington, D.C.

Filed Jun. 23, 1983, Ser. No. 506,969
Int. Cl.³ G01B *7/16*
U.S. Cl. 73—774 **17 Claims**





1. A method for measuring the accumulated strain in a material with a removable strain gauge fixture having a pair of tapered pins, comprising the steps of:

(a) providing a pair of tapered holes in said material which are mateable with said pins of said fixture;

(b) transferring accumulated strain in said material to said fixture by temporarily mating said pins with said holes, said gauge and pins forming an attached unit during said mating;

(c) preventing the transfer of spurious strain to said fixture during said mating of said pins with said holes;

(d) measuring the strain in said fixture; and

(e) removing the pins of said fixture from said material.

4,526,040

OSCILLATION COMPENSATING APPARATUS FOR VORTEX FLOW METER

Naoki Matsubara, Tokyo, Japan, assignor to Oval Engineering Co., Ltd., Tokyo, Japan

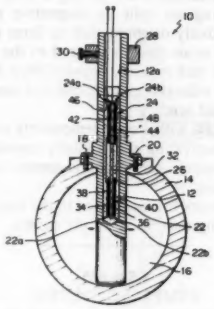
Filed Jul. 18, 1983, Ser. No. 515,090
Claims priority, application Japan, Jul. 22, 1982, 57-126732
Int. Cl.³ G01F *1/32*
U.S. Cl. 73—861.24 **23 Claims**

1. In a vortex flow meter for measuring the flow rate of a fluid which flows through a conduit, an oscillation compensat-

ing apparatus for removing externally derived oscillation noise applied to the flow meter, comprising:

an elongate vortex shedding member extending into the conduit through part of a wall of the conduit, said vortex shedding member having a shedding portion constituted by a portion thereof located inside the conduit and a compensating portion constituted by a portion thereof located outside the conduit;

first oscillation sensor means disposed in the shedding portion for sensing an oscillation component caused in the shedding portion by a vortex train and the externally



derived oscillation noise, and outputting a first signal having a frequency which corresponds to the oscillation and noise components; and

second oscillation sensor means disposed in the compensating portion for sensing only the noise component and outputting a second signal having a frequency which corresponds to the noise component;

said vortex shedding member being in the form of a cylinder having a bore thereinside, one end of which is closed;

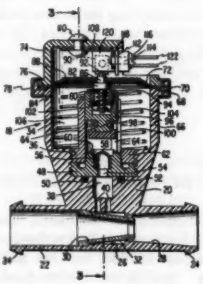
each of the first and second oscillation sensor means comprising elongate base electrode means extending in said bore along the axis of the vortex shedding member.

4,526,041

DIGITAL FLUID FLOW RATE SENSOR

Wilbert E. Beller, Park Ridge, and Edward J. Mateja, Hillside, both of Ill., assignors to The Singer Company, Stamford, Conn.

Filed Feb. 21, 1984, Ser. No. 581,520
Int. Cl.³ G01F *1/38*
U.S. Cl. 73—861.47 **9 Claims**



1. Apparatus for providing a digital signal related to the rate of flow of a fluid through a conduit comprising:

means for providing a restriction in said conduit;

a housing having a chamber formed therein;

a diaphragm sealing said chamber;

an open passageway through said housing between said chamber and the exterior of said housing;

means for controlling the flow rate through said passageway

means for providing communication between said chamber and said conduit in the vicinity of said restriction;

a valve seat supported on said housing at the entrance of said communication means into said chamber;

a valve seat seal coupled to move with said diaphragm toward and away from sealing engagement with said valve seat;

means for biasing said valve seat seal away from said valve seat; and

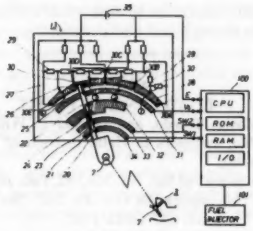
switching means coupled to said diaphragm for providing said digital signal.

4,526,042

AIR FLOW MEASURING APPARATUS

Hisamitsu Yamazoe; Hideki Matsuura, both of Kariya; Katsunori Ito, Aichi, and Masahiro Ohba, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 14, 1983, Ser. No. 466,143
Claims priority, application Japan, Feb. 17, 1982, 57-23889
Int. Cl.³ G01F *1/28*
U.S. Cl. 75—861.75 **8 Claims**



1. Air flow measuring apparatus, comprising:

a resistor portion connecting serially at least two resistors;

a voltage circuit for supplying a voltage of predetermined magnitude and polarity to said resistors;

an insulated movable member, which is rotated about a pivot depending on air flow, having a plurality of contacts thereon for indicating the amount of said air flow by contacting one of said resistors depending upon the position of said movable member, such indications constituting voltage signals formed by said supplied voltage and the contacted resistor; and

a switch portion, associated with said movable member, for generating digital signals from said supplied voltage, said digital signals being representative of said contacted resistor.

4,526,043

CONFORMABLE TACTILE SENSOR

Robert A. Boie, and Gabriel L. Miller, both of Westfield, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 23, 1983, Ser. No. 497,182
Int. Cl.³ G01L *1/14, 5/16*
U.S. Cl. 73—862.04 **5 Claims**

1. A force sensor comprising:

an elastic dielectric;

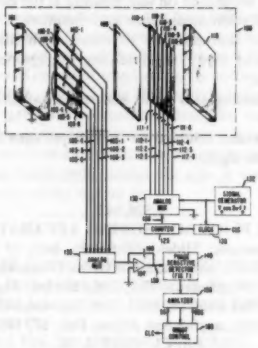
a plurality of conductive elements on one side of said elastic dielectric;

a plurality of conductive elements on the opposite side of said elastic dielectric;

means for applying first signals to one plurality of conductive elements;

means coupled to said other plurality of conductive elements

responsive to said first signals for generating second signals representative of the forces on said elastic dielectric; wherein said first signal applying means comprises a plural-



ity of first signal supplying conductive elements terminating on the opposite side of said elastic dielectric for coupling said first signals to said one plurality of conductive elements through said elastic dielectric.

4,526,044

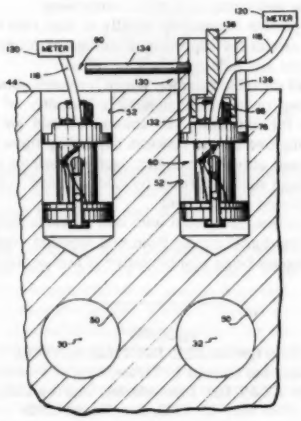
LOAD SENSING PROBE

Robert L. Moser, Toledo, and Donald F. Wilhelm, Maumee, both of Ohio, assignors to Helm Instrument Company, Inc., Maumee, Ohio

Continuation-in-part of Ser. No. 348,992, Feb. 16, 1982, Pat. No. 4,412,456. This application Oct. 28, 1983, Ser. No. 546,727

Int. Cl.³ G01L *1/22, 5/00*

U.S. Cl. 73—862.06 **17 Claims**



1. A load sensing probe for measuring work forces in a machine tool comprising, in combination,

a generally cylindrical member having first and second regions of substantially equal outside diameter and a third, intermediate region smaller than and disposed between said first and said second regions,

slots extending from said first and said second regions into said intermediate region, said slots disposed at a right angle to one another and defining pairs of spaced-apart arms,

strain gauge means secured to a pair of said spaced-apart arms for sensing the strain experienced by said arms, and

preloading means for radially translating said pairs of arms, said preloading means including a pair of wedge means for driving said pairs of arms radially outwardly and means for translating said wedge means toward one another.

17. A method of measuring work forces applied to a back-up member in a machine tool having an elongate cavity extending laterally from a point adjacent the working station, comprising the steps of:

inserting a load sensing probe into such cavity, said probe having a cylindrical body having a first and second enlarged end regions split by respective pairs of axially extending radially oriented slots to form respective pairs of arms, and strain gauges secured to the arms of one of said enlarged end regions, opposed flats disposed on the other of said enlarged end regions and means for radially translating said arms,

engaging said flats with a complementarily configured apparatus while activating said radially translating means to move said sensing arms into engagement with the wall of said cavity and

measuring the work forces applied to the back-up member as relative closing movement of the cavity.

4,526,045

SAMPLING SYSTEM

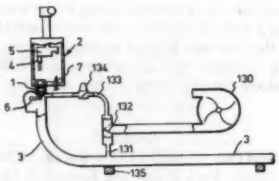
John Reekie, Warrington, England, assignor to British Nuclear Fuels Limited, Warrington, England

Filed Apr. 18, 1983, Ser. No. 486,212

Claims priority, application United Kingdom, May 5, 1982, 8212943

Int. Cl.³ G01N *1/10*

U.S. Cl. 73—864.31 **9 Claims**



1. A sampling system comprising an examination station, a sampling station, pneumatic conveyor means between the stations, carriers for transport along the conveyor means between the stations, sample bottles carried by the carriers and transfer means at the sampling station including a transfer arm operable to (a) cooperate with a carrier, (b) remove the bottle from the carrier (c) deliver the bottle to a sample dispenser to introduce sample into the bottle and (d) return the bottle containing sample to the carrier for return to the examination station.

4,526,046

METHOD AND APPARATUS FOR TRANSFERRING A LIQUID SAMPLE

Rudolf Oberli, Langenthal, Switzerland, assignor to Greiner Instruments AG, Langenthal, Switzerland

Filed Sep. 1, 1983, Ser. No. 528,472

Claims priority, application Switzerland, Sep. 7, 1982, 5307/82

Int. Cl.³ B01L *3/02*

U.S. Cl. 73—864.16 **9 Claims**

1. Apparatus for transferring a liquid sample, comprising

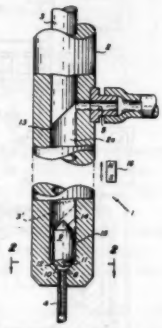
(a) a positive displacement syringe, including

(1) a vertically arranged cylindrical storage tube (2) containing a vertical bore extending downwardly from its

upper end and terminating in spaced relation from its lower end, said bore defining a storage chamber (*2a*), said storage tube containing an opening at its lower end communicating with said chamber, the lower end of the chamber wall converging downwardly toward said opening to define a frusto-conical transition surface (**8**);

(2) a plunger member (**3**) slidably mounted in the upper end of said bore for vertical movement between upper and lower positions relative to said storage tube; and

(3) a cylindrical cannula member (**4**) connected with the opening in the lower end of said storage tube; and



(b) means for preventing the formation of gas bubbles during the introduction of liquid into the chamber when said plunger is displaced toward its upper position, including a generally cylindrical body member (**9**) vertically arranged within said storage chamber, a portion of the lower end of said body member being operable to cooperate with said frusto-conical transition surface to define a plurality of liquid passages (**12**) therebetween, said body member portion remaining in contact with said frusto-conical transition surface when liquid flows from said cannula into said chamber via said passages.

4,526,047

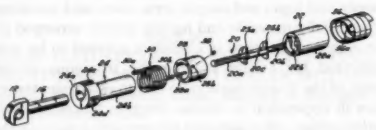
ENERGY ABSORBER

Elmer C. Yang, Orange, Calif., assignor to Pacific Scientific Company, Anaheim, Calif.

Filed Dec. 7, 1982, Ser. No. 447,704

Int. Cl.[3] **F16H** *21/16, 21/40;* **B60T** *7/12;* **F16D** *51/00*

U.S. Cl. 74—25 **10 Claims**



1. An energy absorbing device comprising:

an axially movable strut member for receiving energy to be absorbed or movement to be damped;

means forming a cylindrical brake surface;

a capstan spring having one or more coils frictionally engaging the braking surface to resist relative movement between the spring and said surface;

means for translating axial movement of said strut member into rotation of one of said cylindrical surface and said capstan spring; and

preloaded spring means connected to one end of the capstan spring in a manner such that the spring means will permit the capstan spring to unload slightly at a predetermined torque and drag with respect to the cylindrical surface.

4,526,048

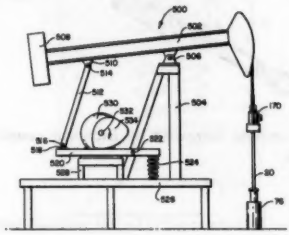
METHOD FOR PUMPING A LIQUID FROM A WELL AND APPARATUS FOR USE

George E. Stanton, Orient, Ohio, assignor to Nujack Oil Pump Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 200,899, Oct. 27, 1980, Pat. No. 4,406,597, which is a continuation-in-part of Ser. No. 156,780, Jun. 5, 1980, Pat. No. 4,346,620. This application Aug. 11, 1982, Ser. No. 407,288

Int. Cl.[3] **F04B** *47/02*

U.S. Cl. 74—53 **8 Claims**



1. In apparatus for pumping a liquid from a well comprising a pump jack having a rocker arm pivoted intermediate its ends and a sucker rod attachment means mounted on one limb of said rocker arm and a counterweight mounted on the opposed limb of the rocker arm,

a link member extending downwardly from the opposed limb of said rocker arm,

a pivoted lever connected to said link member,

a drive means and a cam member rotatable by the drive means and contacting said lever, thereby controlling the movement of said sucker rod attachment means,

said lever is attached to an energy-storage means arranged to store energy therein during the downward stroke of said sucker rod attachment means and to release said energy during the upward stroke of said sucker rod attachment means, thereby assisting said upward stroke of said sucker rod attachment means,

said cam member is so shaped that, at the end of the upward stroke of said sucker rod, the upward force applied to said sucker rod is progressively and continuously decreased, thereby commencing the movement of the sucker rod through its downward stroke without imposing a substantial impulsive loading on the sucker rod.

4,526,049

VIBRATOR

Anton Pöttgens, Aachen, Fed. Rep. of Germany, assignor to Jean Netter, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,446

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107238

Int. Cl.[3] **B01F** *11/00;* **F16H** *33/00*

U.S. Cl. 74—87 **2 Claims**

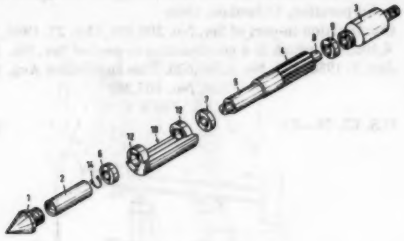
2. A vibrator for shaking materials, such as concrete or the like, comprising:

a casing,

a drive shaft in said casing,

an imbalance member of axially elongated semi-cylindrical shape and being exclusively supported by said drive shaft in said casing, said imbalance member having a pair of spaced-apart bearing boxes positioned at the remote ends thereof, said bearing boxes being formed in encircling relation to said drive shaft and forming a clearance fit with said shaft, with a major portion of said imbalance member

being positioned eccentrically of said shaft whereby rotation of said shaft imparts concurrent rotation of said imbal-



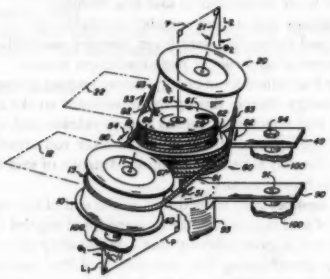
ance member therewith by frictional coupling therebetween.

4,526,050

SELF-TENSIONING DIFFERENTIAL CAPSTAN CABLE DRIVE MECHANISM

Robert A. Johnson, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 4, 1982, Ser. No. 336,816
Int. Cl.³ F16H *27/02, 29/02;* G05G *1/08*
U.S. Cl. 74—89.22 **6 Claims**



1. A differential capstan cable drive mechanism for movement of an oscillating member rotatably mounted on a fixed structure comprising:

a differential capstan affixed to the oscillating member for movement therewith, said capstan having an axis of rotation, having a first drum with a relatively larger diameter, and having a second drum with a relatively smaller diameter;

a first roller mounted on the structure and having an axis of rotation;

a second roller mounted on the structure and having an axis of rotation;

a first cable having a first end connected to said first drum, having a portion wrapped around said first drum, having a portion looped around said first roller, having a portion wrapped around said second drum, and having an end connected to said second drum; and

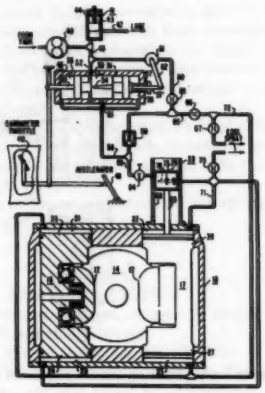
a second cable having an end connected to said second drum, having a portion wrapped around said second drum, having a portion looped around said second roller, having a portion wrapped around said first drum, and having an end connected to said first drum.

4,526,051

INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION SPEED CONTROL ARRANGEMENT

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Mar. 18, 1983, Ser. No. 476,814
Int. Cl.³ F16H *15/08;* B60K *41/04, 41/06, 41/08*
U.S. Cl. 74—200 **15 Claims**



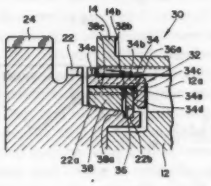
1. A speed control arrangement for an infinitely variable traction roller transmission comprising a housing, coaxial input and output toric traction roller discs rotatably supported in said housing, said toric discs having toric traction surfaces arranged opposite each other so as to define therebetween a toric cavity of circular cross-section; at least two motion transmitting traction rollers arranged in radial symmetry between, and in engagement with, said toric discs for the transmission of motion therebetween; pivotal support trunnions rotatably supporting said traction rollers between said toric discs and being supported in said housing pivotally about an axis which is essentially tangential to the center circle of said toric cavity so as to permit changing of the ratio of motion transmission between said input and output toric discs, said trunnions being further axially movable and having pistons arranged at one of their ends and disposed in cylinders adapted to be selectively pressurized for axially moving the trunnions to initiate a change of the transmission ratio and to establish axial trunnion forces in opposition to torque reaction forces applied to the traction rollers when a torque is transmitted through the transmission, said speed control arrangement including a pressurized fluid source; a torque control valve operable by an accelerator and adapted to control fluid flow from said fluid source into a control fluid line connected to the control cylinders at one end of each trunnion to establish a control fluid pressure depending on the position of the torque control valve, a backup fluid line connected to said control fluid line and the backup cylinders at the opposite ends of said trunnions and including a backup orifice, said backup control fluid line including a drain orifice so as to provide, in cooperation with said backup orifice, for backup fluid pressure in said backup cylinders which is lower than in said control cylinders thereby establishing a pressure differential between said control and backup cylinders which depends on said control fluid pressure.

4,526,052

SYNCHROMESH MECHANISM FOR TRANSMISSION

Kazuyoshi Hiraiwa, Atsugi, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Dec. 27, 1982, Ser. No. 452,902
Claims priority, application Japan, Feb. 5, 1982, 57-14018[U]
Int. Cl.³ F16H *3/38*
U.S. Cl. 74—339 8 Claims



1. A synchromesh mechanism for a transmission having an input gear and an output shaft comprising:

a hub splined to the output shaft of the transmission and having external teeth;

a sleeve surrounding said hub and having internal teeth meshing with said external hub teeth;

a clutch gear rotatable together with the input gear of the transmission;

a cone clutch having a cone rotatable with the input gear;

a friction ring having a portion thereof shaped complementary to that of said cone clutch;

a pusher ring having teeth that match said internal sleeve teeth, said pusher ring drivingly connected to said hub in such a manner that the pusher ring and the hub are limitedly movable in the direction of the relative rotation, said pusher ring being axially movable for shifting the cone clutch into an engaged position;

a lever member interposed between said pusher ring and said friction ring and pivotally supported on said input gear so that is pivots in response to the axial movement of said pusher ring and exerts a force operative to press the cone and the complementary shaped portion of said friction ring together, which force is multiplied by the effect of leverage; and

means interengaging said friction ring, said lever member and said pusher ring for coupling said lever and said rings for mutual rotation and axial movement comprising external projections on said lever member and said friction ring and an internal groove in said pusher ring.

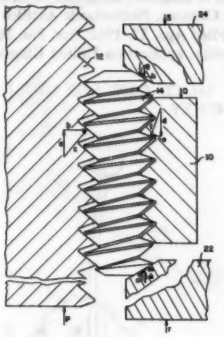
4,526,053

STABILIZED APPARATUS FOR CONVERTING ROTATIONAL MOTION TO LINEAR MOTION

William W. Carson, Mendon, Mass., assignor to Millipore Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 466,283, Feb. 14, 1983,. This application Jul. 29, 1983, Ser. No. 518,701
Int. Cl.³ F16H *1/20*
U.S. Cl. 74—424.8 C 20 Claims

1. Apparatus for converting rotational motion to linear motion which comprises a screw shaft having a primary screw shaft thread, a nut surrounding said screw shaft, said nut having an inner surface and a primary nut thread on said inner surface, at least one planetary roller having primary threads, means to maintain said nut and screw shaft concentric, said planetary rollers being interposed between and meshing with said primary nut helical thread and said primary screw shaft thread, said planetary rollers and at least one of said nut or screw shaft having a secondary locking thread or secondary locking thread path, said secondary locking thread or secondary locking thread path intersecting the primary thread path on said planetary rollers and at least one of said screw shaft or nut



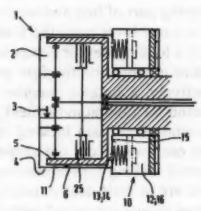
and secondary locking thread being positioned to fit only with a locking thread path during rotation of said planetary rollers.

4,526,054

GEAR TRANSMISSION WITH SPLASH LUBRICATION

Friedrich Ehrlinger, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,611
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208100
Int. Cl.³ F16H *57/04;* F01M *3/00*
U.S. Cl. 74—467 17 Claims



1. A gear transmission having a gear housing and splash lubrication in which in its idle state, the gear housing is filled with oil up to a desired level and in an operating state, the oil is carried along by rotating gear parts in the direction of rotation to form an oil ring, which contacts an interior casing surface of the gear housing, with a radial thickness which is determined by the volume of said oil to provide rotating parts with a submersion depth in the oil which is adequate for the splash lubrication, in which gear housing the submersion depth can be changed as desired in dependence on load conditions of the transmission and wherein the interior of the housing defines an axis of rotation and has two axially neighboring zones in the first of which the splash lubrication takes place and the second of which forms another cylindrical collection reservoir for a portion of the lubrication oil from the first zone, the zones being interconnected by a port in the location of a minimum desired oil ring thickness in the first zone, whereby during normal operation, oil from the first zone is displaced through said interconnection port into the second zone, and means for returning oil from the second zone into the first zone under heavy-load operation.

4,526,055

LOCKABLE CONTROL LEVER ARRANGEMENT

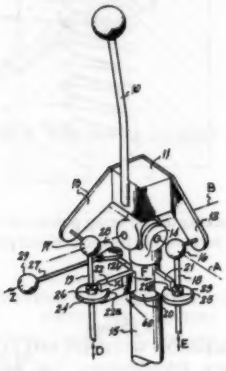
Frederick H. Batchelor, Stretford, and David J. Brown, Kenilworth, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Apr. 12, 1982, Ser. No. 367,691

Claims priority, application United Kingdom, Apr. 21, 1981, 8112380

Int. Cl.³ G05G *5/02, 9/02, 11/00*

U.S. Cl. 74—471 XY **1 Claim**



1. A lockable control lever arrangement for the control of first and second hydraulic valves which each have a neutral position in which the operation of an associated function is prevented, the arrangement comprising a control lever mounted on a generally vertically extending stand for pivotting about two perpendicular axles to operate said valves; first and second generally vertically extending operating members respectively forming part of first and second linkage means for connecting the control lever with the first and second valves respectively; and a locking device comprising first and second locking formations mounted on the first and second operating members respectively, a locking member which encircles a portion of the stand for pivotal movement about the stand in a generally horizontal plane, said locking member having first and second arms each with a cut out shaped to receive part of the first and second locking formations respectively when the associated valves are in their neutral positions and a manually operable operating means connected with the locking member for pivotting the locking member between an unlocked position in which both linkage means are free to move and locked position in which both cut outs receive their associated locking formation to prevent movement of the associated linkage means and hence lock the control lever and the associated valves in their neutral positions.

4,526,056

CHOKE LEVER DEVICE FOR A TWO-WHEELED MOTOR VEHICLE

Isao Yamanaka, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 419,277

Claims priority, application Japan, Sep. 19, 1981, 56-148147

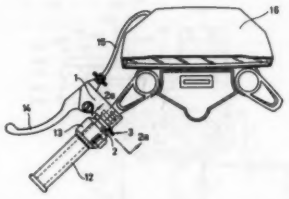
Int. Cl.³ G05G *13/00*

U.S. Cl. 74—489 **6 Claims**

1. A choke adjustment lever device for a two-wheeled motor vehicle having a handle pipe, the improvement comprising,

a two piece choke lever holder mounted on said pipe, and means to clamp said choke lever holder to said handle pipe, said choke lever holder having an inner periphery with a circumferential protrusion extending inwardly towards said pipe,

a choke lever rotatably mounted on said handle pipe in engagement with said choke lever holder, said choke lever comprising an engaging ring disposed about said handle pipe for rotatable motion about said handle pipe, and a hand controllable portion extending outwardly from said engaging ring external to said choke lever holder,



said engaging ring having an outer periphery with a groove for receiving said protrusion, said groove being defined by at least one ridge portion on the outer periphery of said engaging ring, said protrusion extending between said one ridge portion and said hand controllable lever, and

a choke wire connected to said choke lever at a position shielded from the outside by the engagement of said protrusion in said groove.

4,526,057

RECIPROCATING TYPE PUSH-PULL CABLE ARRANGEMENT FOR TRANSMITTING LONGITUDINAL MOTION

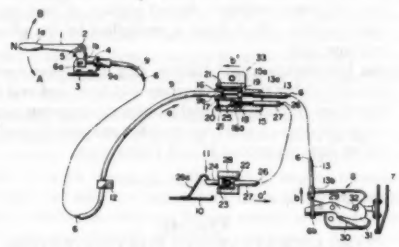
Haruo Mochida, Kanagawa, and Yoshio Watanuki, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 23, 1983, Ser. No. 507,074

Claims priority, application Japan, Jul. 20, 1982, 57-126231

Int. Cl.³ F16C *1/10*

U.S. Cl. 74—501 R **4 Claims**



1. A push-pull cable arrangement for transmitting longitudinal motion, comprising:

a wire having a front end, a rear end and an intermediate node between the front end and the rear end,

a first casing enclosing the wire between the front end and the intermediate node, and having a front end and a rear end,

a second casing enclosing the wire between the intermediate node and the rear end, and having a front end and a rear end,

an input unit having a stationary member to which the front end of the first casing is fixed, and a movable member connected with the front end of the wire and capable of pulling the wire from the first casing and pushing the wire into the first casing,

an intermediate unit having a first member to which the rear end of the first casing is fixed, and a second member to

which the front end of the second casing is fixed, the first member and the second member having a closest position in which the first member and the second member abut against each other so as to prevent the distance between the rear end of the first casing and the front end of the second casing from becoming lower than a predetermined minimum distance, the first member and the second member receiving the wire slidably and allowing the intermediate node of the wire to move longitudinally between the rear end of the first casing and the front end of the second casing even when the first and second members are in the closest position, the first and second members being relatively movable away from each other rectilinearly so as to increase the distance between the rear end of the first casing and the front end of the second casing beyond the minimum distance, the intermediate node being capable of pushing the second member when the intermediate node is closest to the front end of the second casing,

link means comprising a link member having a front end and a rear end, the front end of the link member being connected with the intermediate unit and caused to move longitudinally by the relative movement between the first and second members of the intermediate unit,

a first receiving unit having a first member connected with the rear end of the wire and a second member connected with the rear end of the second casing, and

a second receiving unit having a movable member connected with the rear end of the link member and caused to move by the link member, wherein the second member of the intermediate unit is a stationary housing having a hole which extends longitudinally of the wire and has a bottom, and the first member of the intermediate unit is a sliding member slidably contained in the hole of the housing, the sliding member having a hole which extends longitudinally of the wire, contains the intermediate node longitudinally movably and opens toward the bottom of the hole of the housing, the sliding member abutting against the bottom of the hole of the housing when the sliding member and the housing are in the closest position, the hole of the sliding member allowing the intermediate node to project from the hole of the sliding member and to move away from the rear end of the first casing, the bottom of the hole of the housing limiting the longitudinal movement of the intermediate node toward the front end of the second casing.

4,526,058

CENTERING AND LOCK MECHANISM FOR HYDRAULIC ACTUATOR

Manfred A. Runkel, Valencia; William W. Hsu, Burbank; Anthony E. Singer, Newhall, and William J. Zlotski, Canyon County, all of Calif., assignors to HR Textron Inc., Valencia, Calif.

Filed Jun. 2, 1983, Ser. No. 500,470
Int. Cl.³ G05G *5/06*; F16H *21/44*
U.S. Cl. 74—531 **14 Claims**

1. In a hydraulic actuator including a piston and a rod, apparatus for moving said actuator rod to predetermined position and locking the rod at the predetermined position comprising:

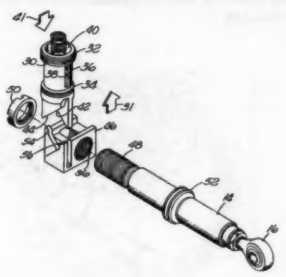
first means defining a ramp cam surface means on said actuator rod, said cam surface means defining a first acute angle with respect to the longitudinal axis of said rod;

second means defining a ramp drive surface means, said drive surface means defining a second acute angle with respect to the longitudinal axis of said rod, said drive surface disposed opposed said cam surface, said first and second angles being substantially equal;

one of said cam surface means and said drive surface means defining a recess therein and the other of said cam surface means and drive surface means including a lobe extending therefrom;

means for moving said drive surface means between first and second positions into engagement with and away from said cam surface means respectively;

said lobe first engaging said opposed surface as said drive surface moves into engagement with said cam surface; and



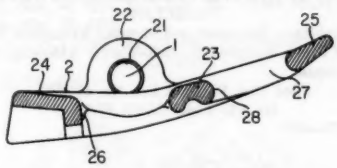
said recess receiving said lobe for locking said rod in said predetermined position when said drive surface means is in said first position.

4,526,059

PEDAL FOR A BICYCLE

Nobumi Takeda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Oct. 30, 1979, Ser. No. 89,353
Claims priority, application Japan, Nov. 11, 1978, 53-155526[U]
Int. Cl.³ G05G *1/14*
U.S. Cl. 74—594.4 **3 Claims**



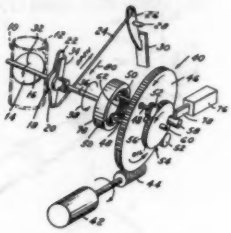
1. A bicycle pedal rotatably supported to a crank arm comprising a pedal shaft and a pedal body supported rotatably to said crank arm through said pedal shaft, said pedal body having a first foot bearing surface provided forwardly with respect to an extension line of the axis of said pedal shaft for receiving a root portion of a cyclist's toes, a second foot bearing surface provided rearwardly with respect to said extension line for receiving a ball portion of a cyclist's foot and a pedal body extension extending forwardly of said first foot bearing surface having at a front terminating end thereof a third foot bearing surface for receiving a tip portion of a cyclist's toes, said pedal body being displaced downwardly with respect to the axis of said pedal shaft so that said foot bearing surfaces always face upward, wherein said third foot bearing surface is positioned higher with respect to said first and second surfaces when a rear portion of said pedal body is horizontally positioned, and wherein when a rear portion of said pedal body is horizontally positioned, said second foot bearing surface slants forward and downwardly, said first foot bearing surface is positioned higher than said second foot bearing surface and slants forward and upwardly, and said third foot bearing surface slants forward and upwardly in the direction of inclination of said first foot bearing surface.

4,526,060

CARBURETOR THROTTLE VALVE ACTUATOR

Shunso F. Watanabe, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 28, 1982, Ser. No. 425,825
Int. Cl.[3] F02D 9/00
U.S. Cl. 74—626 5 Claims



1. A motor vehicle throttle valve actuator for controlling the opening of the throttle valve in a first speed control range of movement between the idle speed and wide open throttle valve positions, and a second idle speed range of movement between an essentially closed throttle valve position and a fast idle throttle valve speed position; comprising,

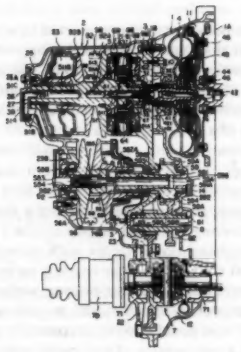
compound planetary gear drive means operatively coupled to said throttle valve for moving said valve through said ranges, holding means operably engagable with a member of the gear means to effect a reduction drive operation of the throttle valve in the second range, and clutching means for locking up the planetary gear drive means to effect operation of said throttle valve through said first range.

4,526,061

STEPLESS AUTOMATIC TRANSMISSION FOR MOTOR VEHICLES

Shiro Sakakibara, Toyokawa, and Mutsumi Kawamoto, Nagoya, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Mar. 18, 1983, Ser. No. 476,542
Int. Cl.[3] F16H 37/00, 37/08
U.S. Cl. 74—689 2 Claims



1. In a stepless automatic transmission for motor vehicles, including an automatic transmission case, a first shaft coupled with the output shaft of an engine and rotatably supported by said transmission case, a second shaft disposed parallel with said first shaft and supported by said transmission case rotatably at three support points, and a third shaft disposed parallel with said second shaft and rotatably supported by said transmission case, transmitting power from said first to second shaft by a V-belt type stepless transmision and from the second to third shaft by meshed engagement of an output gear mounted on said second shaft and an input gear mounted on said third shaft:

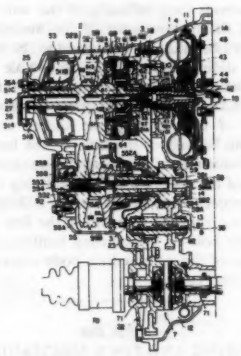
said second shaft is divided into an input section mounting an output pulley of said V-belt type stepless transmission and an output section mounting said output gear, one of said input and output sections being rotatably supported at one outer support point and an intermediate support point of said three support points and formed with an inner spline on the side of said intermediate support point while the other one of said input and output sections being rotatably supported at the other outer support point and formed with an outer spline on the side of said intermediate support point for fitting engagement with said inner spline.

4,526,062

STEPLESS AUTOMATIC TRANSMISSION FOR MOTOR VEHICLES

Shiro Sakakibara, Toyokawa, and Mutsumi Kawamoto, Nagoya, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Mar. 18, 1983, Ser. No. 476,805
Int. Cl.[3] F16H 37/00, 37/08
U.S. Cl. 74—689 1 Claim



1. In a stepless automatic transmission for motor vehicles, including an automatic transmission case, a first shaft coupled with the output shaft of an engine and rotatably supported by said automatic transmission case, said automatic transmission case including a torque converter case accommodating a fluid joint, said transmission case fastened to said torque converter case and accommodating a V-belt type stepless transmission, and a center case interposed between said torque converter and transmission cases; a second shaft disposed parallel with said first shaft and supported by said transmission case rotatably at three support points on said torque converter case, transmission case and center case; and a third shaft disposed parallel with said second shaft and rotatably supported by said automatic transmission case; transmitting power from said first to second shaft by said V-belt type stepless transmission and from the second to third shaft by meshed engagement of a helical output gear mounted on said second shaft and a helical input gear mounted on said third shaft:

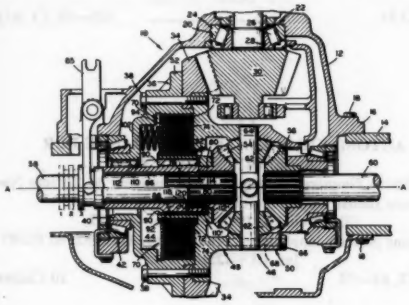
said second shaft is divided into an input section and an output section, and said helical output gear is mounted between said support points on said torque converter and center case and rotatably gripped between said torque converter and center cases through a roller bearing.

4,526,063

THREE MODE DIFFERENTIAL

Terry L. Oster, Waterloo, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 19, 1982, Ser. No. 350,541
Int. Cl.[3] F16H *1/44;* F16D *47/00*
U.S. Cl. 74—710.5 8 Claims



1. In a limited slip axle differential including a differential case, pinion means for driving said case, first and second clutch means externally positioned of said case, and at least two output drive members driven by said case; said first clutch means comprising at least one input and at least one output friction member, said input friction member rotatably secured to said case, said output friction member secured to said second clutch means for rotation therewith, said first clutch means further comprising spring means for loading said input and output friction members into driving engagement with each other, said second clutch means comprising a clutch collar slidable over one of said output drive members, said collar selectively actuable between first and second positions, the first of said positions for operatively connecting said first clutch means to said output drive member, and the second for operatively disconnecting said first clutch means from said output drive member; an improvement comprising said collar being selectively movable to a third position, said third position for operatively connecting one of said output drive members directly to said differential case for fixed coupled rotation of said output drive member with said case, the positional movement of said collar effecting the driving of both said output drive members by said case.

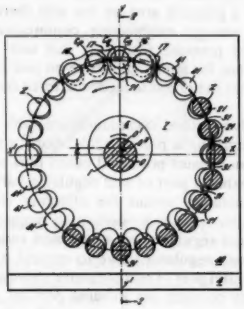
4,526,064

MOTION TRANSMITTING DEVICES

John C. Carden; Panayotis C. Dimitracopoulos, both of Nassau, The Bahamas, and George D. M. Arnold, Jersey, Channel Islands, assignors to Quadrant Drive B.V., Leersum, Netherlands

Continuation of Ser. No. 238,781, Feb. 27, 1984, abandoned.
This application Jan. 26, 1984, Ser. No. 573,998
Claims priority, application United Kingdom, Apr. 2, 1980, 8011061
Int. Cl.[3] F16H *1/28, 13/06*
U.S. Cl. 74—804 81 Claims

1. A motion-transmitting device comprising, eccentric means in the form of a toothed wheel with first profiles constituted by the recesses between adjacent evenly spaced teeth, first movable meshing connector elements, and movement-limiting means in the form of second profiles evenly spaced in a datum member which holds said connector elements in loose captive dependency, each connector element being freely orbital and rotatable in said datum member, wherein the connector elements, when engaged, are each in rolling driving engagement with both the first and second profiles and the rotation of said eccentric means causes said meshing connector elements sequentially to become engaged with and roll around said first profiles and subsequently to become disengaged from said first profiles and wherein said first and second profiles constrain said connector elements, when drivingly engaged with said first and second profiles, to follow when in driving engagement, an orbital motion relative to both said first and second profiles, thereby causing relative gyratory and rotatory



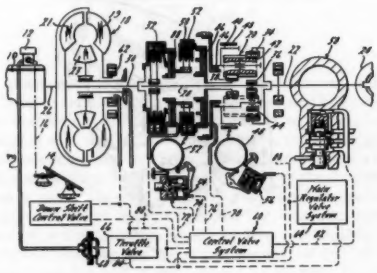
motion between the wheel means and datum member, both the second profile and the recesses constituting the said first profiles being sufficiently large relative to said connector elements to permit said orbital motion by rolling of said connector elements around the contours of said first and second profiles while in driving engagement.

4,526,065

AUTOMATIC TRANSMISSION BRAKE-NEUTRAL CONTROL CIRCUIT

Stanley D. Rosen, Southfield, and William D. Ross, Harbor Springs, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01301, § 371 Date Sep. 20, 1982, § 102(e) Date Sep. 20, 1982, PCT Pub. No. WO84/01131, PCT Pub. Date Mar. 29, 1984
PCT Filed Sep. 20, 1982, Ser. No. 441,594
Int. Cl.[3] B60K *41/16*
U.S. Cl. 74—869 7 Claims



1. In a power transmission mechanism for a wheeled vehicle driveline including a hydrokinetic unit with a throttle-controlled engine driven impeller and a turbine:

a multiple ratio gear system including a torque input shaft connected to the turbine of said hydrokinetic unit;

clutch means and brake means for controlling the motion of gear elements of said gear system to effect multiple forward drive ratios, said brake means including a forward drive clutch that is engaged during operation in a forward drive mode;

a control system for effecting engagement and release of said

clutch means and brake means including a pressure source and a governor valve means for developing a governor pressure that indicates driven speed;

a forward clutch regulator valve in said control system between said pressure source and said forward drive clutch, said regulator valve having a pressure inlet port, a forward drive clutch pressure feed port and an exhaust port said regulator valve having formed thereon a valve land with a pressure area on one side thereof, a pressure feedback passage establishing communication between said clutch pressure feed port and said pressure area, spring means for applying a force on said regulator valve that opposes the pressure feedback force on said regulator valve;

a switch valve in fluid communication with said regulator valve comprising a pressure inlet port, a pressure outlet port and an exhaust port, said outlet port communicating with the exhaust port of said regulator valve;

a solenoid actuator means for effecting shifting of said switch valve to a first position to connect the exhaust ports of said regulator valve and said switch valve thus enabling said regulator valve to control pressure at said pressure outlet port of said regulator valve and to a second position to connect the exhaust port of said regulator valve to the outlet port of said switch valve thereby disabling the pressure regulating action of said regulator valve and establishing communication between the outlet port of said switch valve and the outlet port of said regulator valve;

said governor valve means being connected to said switch valve to oppose movement of the latter to said first position; and

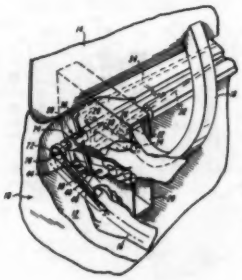
wheel brake switch responsive to wheel brake actuation and a throttle switch responsive to engine throttle movement in series relationship with respect to said solenoid actuator means.

4,526,066

TORSION SPRING ADJUSTING TOOL AND METHOD

George L. Steck, Dayton, Ohio, assignor to Steck Manufacturing Co., Inc., Dayton, Ohio

Filed Apr. 14, 1983, Ser. No. 484,868
Int. Cl.³ B25B *13/48*
U.S. Cl. 81—486 **7 Claims**



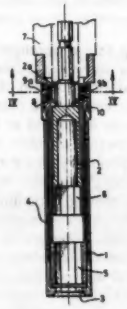
1. A torsion spring adjustment tool comprising, in combination, a shank portion having a longitudinal axis and a surface made flat for wrench engagement, said shank portion supporting at one end thereof confronting plate portions fixed to and straddling said shank portion and spaced apart to receive therebetween a portion of said torsion spring so that when said shank portion is rotated about its longitudinal axis said confronting plate portions will drivingly engage and twist said torsion spring, said plate portions being rectangular with longest sides extending parallel to and lengthwise in the direction of said longitudinal axis, said plate portions having cut-outs in the side edges thereof extending along said longest sides, said cut-outs being spaced longitudinally outwardly from said shank, the confronting faces of said plate portions defining therebetween a first cylindrical passageway the axis of which is oblique to said confronting faces.

4,526,067

AUTOMATIC MOUNTING APPLIANCE FOR ASSEMBLING MEANS

Jean-Pierre Gaquére, Somme, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Feb. 14, 1983, Ser. No. 466,387
Claims priority, application France, Feb. 17, 1982, 82 02597
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—55 **10 Claims**



1. A mounting device for assembling hardware of type including clamp pins, screws, nuts, and the like installed connected to a rotational driving motor disposed in a housing wherein the mounting device comprises

a rotary member connected to the motor,

a first socket mounted coaxially to said rotary member with a non-circular cross-section at one end complementary to a portion of the hardware to be assembled to receive the hardware to be assembled,

a gripping means mounted coaxially to said first socket and angularly shiftably in relation to said first socket and having at one end a second socket having the same cross-section as said first socket with said first and second sockets mounted axially aligned with each other, as said first socket,

a stationary member joined to the housing with said first socket connected to said stationary member,

flexible driving means radially interposed between said rotary member and said gripping means to engagingly drive said gripping means from said rotary member,

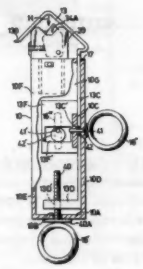
means to angularly shift said gripping means relative to said first socket into a position with said first socket in non-coincidence with said second socket to lock the hardware in the mounting device when said rotary member rotates in one direction and to

angularly shift said gripping means relative to said first socket into a position with said first socket in coincidence with said second socket to unlock the hardware from the mounting device when said rotary member rotates in an opposite direction.

4,526,068
TOOL FOR REMOVING INSULATION

Hans Undin, Åkersberga, and Hans Wiener, Täby, both of Sweden, assignors to C. A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Aug. 12, 1982, Ser. No. 407,475
Claims priority, application Sweden, Aug. 28, 1981, 8105096
Int. Cl.³ H02G 1/12
U.S. Cl. 81—9.4 **14 Claims**



1. A tool for removing insulation from electrical conductors with circular cross-section, comprising in combination:

an apparatus body adapted to be held in the hand by a user and provided at one end with a first part of a non-rotatory, readily dismountable joint comprising two parts;

a knife head replaceably mounted on said body, said knife head provided at one end with the second part of said joint and on the opposite end with a support means for a treated electrical conductor, said support means including two oppositely spaced apart, elevated, straight marginal portions and a straight central recess enclosed between them and open at both ends, so that the conductor can be placed in said recess between said marginal portions;

at least one insulation-cutting knife having a cutting edge and a mounting hole for a retaining pin, and being arranged in said support means so as to a predetermined extent project into said recess;

a holder stirrup having a first portion extending over said support means when said knife head is mounted on said body and having a shape allowing relative rotation of the tool and an inserted conductor, and a second portion by which the stirrup is attached to said body for rectilinear movement in a tightening direction so as to firmly press the cable onto said support means and said at least one knife,

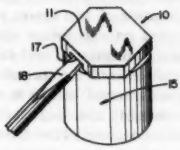
wherein for each said knife there is provided in said knife head a setting means for the exact position-adjustment of said cutting edge, said setting means being defined by a setting screw screwed into a tapped hole arranged in said knife head closer to said cutting edge of said knife than said mounting hole.

4,526,069
ADAPTER FOR WRENCH SOCKETS

Richard L. Cecil, Dayton, Ohio, assignor to Easco Corporation, Baltimore, Md.

Filed Nov. 10, 1983, Ser. No. 550,561
Int. Cl.³ B25B 13/00
U.S. Cl. 81—177.85 **4 Claims**

1. In an adapter for a cylindrical wrench socket, wherein the socket is normally driven by a conventional ratchet wrench or the like, wherein the socket includes an input drive opening having a polygonal cross-section, and wherein the adapter comprises a drive shank having a polygonal cross-section complementary to the input drive opening of the socket, whereby the adapter may be inserted within the socket for driving the same, and a top portion formed integrally with the drive shank at one end thereof and extending laterally therefrom, the top portion having a polygonal configuration, whereby an open-end wrench or the like may be received on the top portion of the adapter for driving the socket whenever the socket would be inaccessible to a ratchet wrench: the improvement which comprises means on the adapter for facilitating a convenient removal of the adapter from the socket,

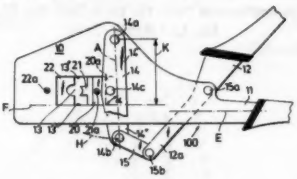


wherein said means comprises the top portion having a a downwardly-facing closed internal slot formed therein, the slot having a transverse width which is substantially less than the length of the adjacent respective side of the polygonal top portion of the socket, whereby a screw driver blade or the like may be inserted into the slot and wedged between the adapter and the top of the socket.

4,526,070
PLIERS-TYPE TOOL

Hans Wiener, Täby, and Hans Undin, Åkersberga, both of Sweden, assignors to C. A. Weidmüller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Aug. 25, 1983, Ser. No. 526,438
Claims priority, application Sweden, Aug. 26, 1982, 8204888
Int. Cl.³ B25B 7/12
U.S. Cl. 81—361 **11 Claims**



1. A pliers-type tool comprising a body member, a first handle fixed to and extending outwardly from said body member and combining with said body member to form a rigid sub-assembly unit, said body member forms a rectilinear guiding track extending in a rectilinear direction and having a first end and a second end extending transversely of the rectilinear direction, a slidable carrier mounted in said guiding track for rectilinear movement thereof between the first and second ends thereof, a first working jaw located on said slidable carrier, a second working jaw located at the second end of said guiding track so that said slidable carrier can be moved toward said second working jaw in the relative movement of said first and second ends from an open position into a closed position, a second handle pivotally connected to said sub-assembly unit, an extension fixed to said second handle and extending from the pivotal connection of said second handle to said sub-assembly unit in an opposite direction from said second handle, toggle means in engagement with said second handle for transmitting force and motion from said second handle to said slidable carrier, said toggle means comprises an elongated driver arm means having a first end and a second end and being in contact with said extension of said second handle at a spaced location from the pivotal connection of said second handle to said sub-assembly unit, said driver arm means extends in the

elongated direction transversely of the direction of said guiding track extending rectilinearly between the first and second ends thereof, each of said ends of said driver arm means being located on an opposite side of said guiding track, and said driver arm means is at said first end thereof pivotally connected at a stationary location on said sub-assembly unit, and said stationary location being spaced laterally from said guiding track in the direction extending transversely of the direction between the first and the second ends of said guiding track, the contact location of said driver arm means and said extension being spaced on said driver arm means from the location of the pivotal connection of said driver arm means and said sub-assembly unit toward the second end of said driver arm means; when said second handle is pivotally displaced relative to said sub-assembly unit, said extension of said second handle displaces said second end of the driver arm means along a circular arc having a radius extending from the center of the stationary location and said circular arc being located on the opposite side of said guiding track from said stationary location of the pivotal connection of said driver arm to said sub-assembly unit, and said driver arm means is in contacting engagement with said slidable carrier at a location between the point of pivotal connection of said driver arm means and said sub-assembly unit and the contact location of said driver arm means and said extension.

4,526,071

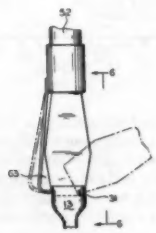
SCREWDRIVER AND JOINING DEVICE

Melvin Post, 7017 N. Laramie, Skokie, Ill. 60077

Continuation of Ser. No. 897,591, Apr. 19, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,207

Int. Cl.³ B25B *15/00*

U.S. Cl. 81—451 **7 Claims**



1. In combination, a rotational driver and a threaded device to be engaged and driven by said rotational driver, the resistance to rotation of the threaded device being substantial, said threaded device having a head portion and a shank, the head portion provided with a diametrial slot in the top surface thereof, and chordal slot means in the side of the head portion and below the top surface thereof substantially at right angles to the diametral slot, the rotational driver having a shank with an elongated blade at one end, a projection at one side of the blade adjacent the free end of the blade and projection transversely of the blade at right angles to the blade, the blade adapted to engage in the diametral slot for drivingly rotating the threaded device and the projection adapted to engage in the chordal slot means for retaining the blade engaged with the threaded device during rotation in both directions.

4,526,072

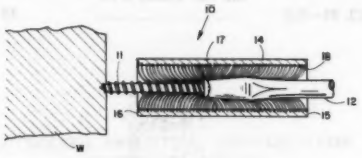
SCREW HOLDING DEVICE

Louis J. Manhoff, Jr., R.R. 2, P.O. Box 2078, Bulverde, Tex. 78163

Filed Aug. 19, 1983, Ser. No. 524,529

Int. Cl.³ B25B *15/00*

U.S. Cl. 81—451 **2 Claims**



1. An apparatus to aid a person to drive a screw or to remove an embedded screw comprising:

a rigid cylindrical tube which is open at both ends and which is filled with a screw holding means on the inner cylindrical wall of the tube and oriented radially towards the center of the axis of the tube;

such screw holding means means including a large number of closely spaced small bristles sufficiently close together and made of flexible material stiff enough to provide numerous contact points with the screw to laterally hold it over its entire length within said tube to hold in place a driver and screw when the driver and screw are inserted into the tube for driving the screw and flexible enough to permit a driver and screw to be inserted from either end of the screw holding means;

the ends of the bristles forming a cylindrical passage extending through the tube for insertion of a screw and driver and said cylindrical passage being smaller than the driver and screw to maintain a hold on the driver and screw throughout their lengths within said tube; and

said bristles extending along the entire length of said tube so that the driver and screw are held laterally by the bristles during driving of the screw.

4,526,073

METHOD AND AN APPARATUS FOR SHEARING HEATED METAL BARS TO BILLETS

Friedrich W. Elhaus, Dorfstr. 21, 7761 Moos, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,590

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215798

Int. Cl.³ B23D *25/16*

U.S. Cl. 83—15 **12 Claims**

1. In the method of shearing hot metal bars by length-responsive shearing means (7–9) to form billets, the bars normally being returned to an oven (100) following the billet-shearing operation;

the improvement which comprises the steps of:

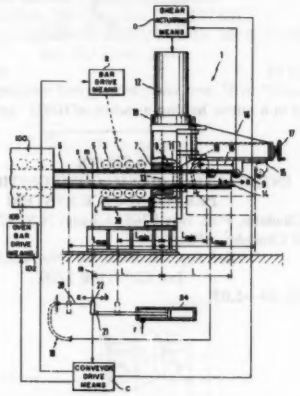
(a) displacing first (5) and subsequent (6) colinearly arranged contiguous bars longitudinally outwardly of said oven to cause the leading edge of the first bar to pass through the shearing plane (13) of a shearing station toward a position in which the forward edge of the first bar is spaced a given distance (L) beyond said shearing plane, and simultaneously detecting during a first detection period whether the butt joint (s) defined between the trailing edge of said first bar and the leading edge of the subsequent bar has entered a permissible zone intermediate said shearing plane and said oven, said zone being generally spaced said given distance (L) from said shearing plane;

(b) shearing from said first bar a billet having a length (L) corresponding with said given distance, thereby to

define a remnant portion of said first bar having a trailing edge intermediate said shearing plane and said oven;

(c) inhibiting the return of said subsequent bar (6) to the oven in the event that a butt joint was detected within said permissible zone during the first detection period;

(d) displacing said remnant portion by the forward portion of the subsequent bar (6) beyond the shearing plane to a position in which the forward edge of the remnant portion is spaced said given distance (L) from said shearing station, and simultaneously detecting during a



second detecting period whether or not the butt joint between the trailing edge of the remnant portion and the leading edge of said subsequent bar had entered the permissible zone;

(e) shearing said subsequent bar forward portion and combining the same with said remnant to define a second billet of said given length; and

(f) returning said subsequent bar to said oven in the event that no butt joint was detected within said permissible zone during the second detection period.

4,526,074

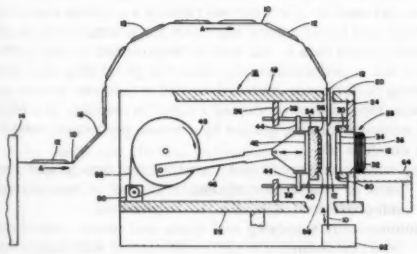
HIGH-SPEED APPARATUS AND METHOD FOR TRIMMING THERMOFORMED ARTICLES

David E. Johnson, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 1, 1982, Ser. No. 445,882

Int. Cl.³ B26F *1/40*

U.S. Cl. 83—97 **9 Claims**



1. A trim apparatus for successively trimming a plurality of thermoformed articles from a surrounding continuous web of a foam plastic film material, comprising:

(a) stationary cutting means including a blade member encompassing a cavity in conformance with the peripheral dimension of each said thermoformed article, said cutting means comprising stationary platen means having a recess extending therethrough and forming said cavity, said blade member being fastened to said platen means so as to extend about the circumference of said recess;

(b) male locator means having a protruding surface portion facing said blade member in axial alignment therewith, said protruding surface portion being dimensioned to conform with the interior dimensions of the thermoformed articles; means for reciprocating said male locator towards and away from said cutting means, said protruding surface portion extending into engagement with said cavity at the end of the forward stroke of said male locating means and being spaced from said cutting means at the return stroke thereof so as to provide a gap between said blade member and said male locator means, said male locator means further comprising a second recess encompassing said protruding surface portion, said second recess for receiving said blade member at said end of a forward stroke of said male locator means;

(c) and means for feeding said web of plastic film material in synchronism with the return stroke of said male locator means through the gap intermediate said trim knife means and said male locator so as to sequentially position thermoformed articles on said web in axial alignment intermediate said cutting means and said male locator means, whereby said protruding surface portion at the forward stroke of said male locator means urges said article onto said blade member so as to cause the latter to trim the article from said plastic web and to retain said trimmed article on said blade member within said cavity.

4,526,075

POTATO PROCESSING APPARATUS

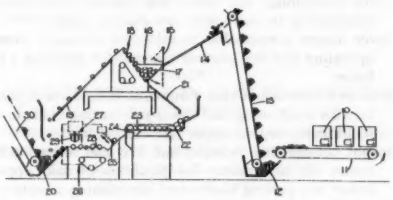
Raymond G. W. Wright, 14 Willow Way, Hauxton, Cambridgeshire, CB2 5JB, England

Filed Jun. 18, 1982, Ser. No. 389,786

Claims priority, application United Kingdom, Jun. 19, 1981, 8119057

Int. Cl.³ B65G *47/26*

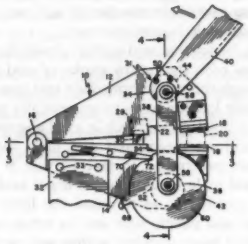
U.S. Cl. 83—409.1 **8 Claims**



1. Potato processing apparatus wherein potatoes are fed by feeding means to a cutting station (27) where they are cut into pieces, comprising feeding means arranged to orient the potatoes in a predetermined manner as they are fed to the cutting station (27), said feeding means orienting the potatoes such that their longest dimensions be transverse to the direction of feeding (F) and also disposing the potatoes in a predetermined position transversely of the feeding direction, said feeding means comprising a walking beam conveyor (28) having first (34,35) and second (37,38) sets of pockets which are movable relative to each other and which are configured to promote said orientation and disposition of the potatoes as the potatoes are conveyed along the conveyor (28) by being transferred from pocket to pocket, the pockets of each set being defined by a series of transversely aligned recesses (36,39) in a plurality of mutually parallel members (31,33) with the members (31) defining the first set of pockets (34,35) being interleaved with the members (33) defining the second set of pockets (37,38), said recesses being formed by generally V-shaped slots (36,39) in

upwardly directed edges of said mutually parallel members (31,33) and extending in the feeding direction (F) and having a pair of opposed edges which are inclined at different angles to the horizontal, with the steeper edges facing in one direction in one set of pockets (34) and in the opposite direction in the other set of pockets (37), and cutting means (29) at the cutting station (27) arranged to cut the oriented and positioned potatoes in at least one cutting plane (41 or 42) which passes generally centrally through said predetermined position.

4,526,076
MULTIPLE STROKE SHEAR
Robert V. Hogan, 4125 Moraga, San Diego, Calif. 92117
Filed Jul. 25, 1983, Ser. No. 517,071
Int. Cl.³ B23D *17/08, 29/02*
U.S. Cl. 83—554 **3 Claims**



1. A multiple stroke shear for use in cutting a workpiece comprising:

an upper and a lower jaw hingedly connected together, and having apertures therein, for transmitting a cutting force;

cutting blades mountable on said upper and lower jaws in opposed operational relationship for cutting a workpiece between said blades;

said upper and lower jaw apertures being spaced between said jaw hinge and said cutting blades, and adjacent to said cutting blades;

a first eccentric means mountable in said upper jaw aperture for positioning said upper jaw cutting blade in spaced relationship to said lower jaw cutting blade;

lever means connectable to said first eccentric means for operating said first eccentric means for applying a cutting force;

a second eccentric means mountable in said lower jaw aperture for positioning said lower jaw cutting blade in spaced relationship to said upper jaw cutting blade;

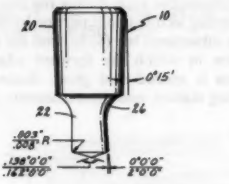
means connectable between said first and second eccentric means for integrating the positions of said upper and lower jaw cutting blades and establishing a cutting force therebetween;

cutting blade regulating means attachable between said second eccentric means and said lower jaw for fixing the position of said lower jaw cutting blade during cutting of a workpiece and for automatically positioning said cutting blades to maintain grippable contact with a workpiece until the workpiece is severed;

means attachable to said lower jaw for supporting said lower jaw during use of the shear.

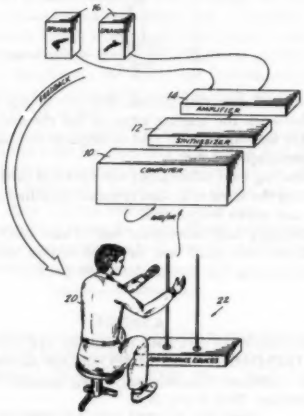
4,526,077
HEAVY DUTY PUNCH
Emmett W. DeGuvera, Grosse Pointe Woods, Mich., assignor to Detroit Punch & Retainer Corporation, Fraser, Mich.
Filed Jul. 21, 1983, Ser. No. 515,807
Int. Cl.³ B26F *1/14;* **B21D** *28/26*
U.S. Cl. 83—686 **2 Claims**

1. A heavy duty punch for piercing armor having a shank by means of which it may be held when in use, and a piercing end projecting axially from said shank, said piercing end terminating in a conical tip having a cone angle of 169° to 176°, said piercing end flaring in a direction toward said conical tip at an



angle of 0° to 2°, and said piercing end merging into said conical tip in a curve having a radius of 0.003" to 0.008".

4,526,078
INTERACTIVE MUSIC COMPOSITION AND PERFORMANCE SYSTEM
Joel Chadabe, P.O. Box 8748, Albany, N.Y. 12208, assignor to Joel Chadabe, Albany, N.Y.
Filed Sep. 23, 1982, Ser. No. 421,900
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **14 Claims**



1. Interactive method of generating music employing a synthesizer; a programmable computer coupled to said synthesizer and capable of storing and running a program containing a music and sound control algorithm for generating music and sound control data in real time to be provided to said synthesizer and a performance algorithm for generating and interpreting performance control data; and at least one human-performer input device producing a signal in response to a physical music-performing gesture by a human performer; comprising the steps of:

generating said music and sound control data in said computer to produce an ongoing, real-time, at least partially non-predeterminable musical composition;

automatically supplying said music and sound control data from said computer to said synthesizer in accordance with said performance algorithm;

scanning the signal from said human-performer input device at periodic intervals to determine whether said human performer is performing said gesture;

if said signal indicates occurrence of said music-performance gesture, then altering said automatic performance algorithm in accordance with said signal and supplying said

performance control data according to the altered performance algorithm; and

producing audible music from said synthesizer, as determined by said performance, music, and sound control data, as audible feedback to said performer.

4,526,079

AUTOMATIC RHYTHM PERFORMANCE DEVICE FOR ELECTRONIC MUSICAL INSTRUMENTS

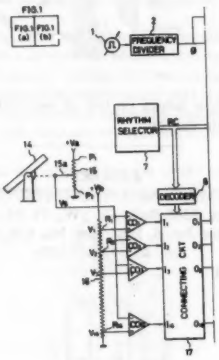
Shigenori Oguri, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

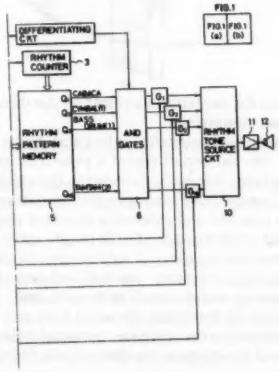
Filed Sep. 30, 1983, Ser. No. 537,631

Claims priority, application Japan, Oct. 19, 1982, 57-183266

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **10 Claims**





1. An automatic rhythm performance device suitable for incorporation into an electronic musical instrument having an expression pedal for controlling the volume of a musical tone produced by the electronic musical instrument itself, comprising:

detecting means for detecting an operation amount of said expression pedal;

rhythm selecting means for selecting a rhythm to be performed among a plurality of rhythms;

pattern signal generating means for generating a plurality of pattern signals representing rhythm patterns determined by said selected rhythm;

sound means, receiving said pattern signals, for converting said pattern signals to rhythm instrument tones respectively, said rhythm instrument tones being sounded in accordance with the corresponding rhythm patterns; and

control means for changing the number of said rhythm instrument tones sounded in accordance with said detected operation amount of said expression pedal.

4,526,080

AUTOMATIC RHYTHM PERFORMING APPARATUS

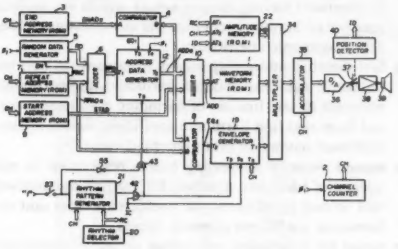
Takehisa Amano, Thomaston, Ga., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 31, 1983, Ser. No. 546,893

Claims priority, application Japan, Nov. 4, 1982, 57-193667

Int. Cl.³ G10H *1/42, 1/46, 7/00*

U.S. Cl. 84—1.03 **8 Claims**



7. An automatic rhythm performing apparatus comprising:

means for generating independent tone signals representing a variety of musical instruments;

means for combining the signals to produce one output signal;

means for varying the level of the output signal; and

means for detecting the level of the output signal and for altering each of said independent tone signals representing said variety of musical instruments based on the detected level of the output signal so as to produce at all output signal levels an optimum signal level relationship between the independent tone signals representing said variety of musical instruments.

4,526,081

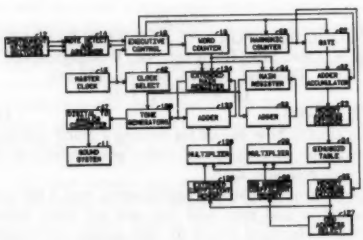
EXTENDED HARMONICS IN A POLYPHONIC TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jul. 16, 1984, Ser. No. 631,419

Int. Cl.³ G01H *1/06*

U.S. Cl. 84—1.23 **9 Claims**



1. In combination with a musical instrument in which a plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed from a preselected set of harmonic coefficients and are trans-

ferred sequentially to a means for conversion into musical waveshapes, apparatus for producing musical tones having an extended number of harmonics comprising;

a first waveshape memory means,

a second waveshape memory means,

a first harmonic coefficient memory means for storing a first set of harmonic coefficients at addressable memory locations,

a second harmonic coefficient memory means for storing at addressable memory locations a second set of harmonic coefficients corresponding to said extended number of harmonics,

a harmonic number generating means whereby a sequence of harmonic numbers is generated wherein the elements of said sequence of harmonic numbers are integers increasing in unit increments and said sequence of harmonic numbers is generated having integer values which are modulo the number of harmonic coefficients comprising said second set of harmonic coefficients,

a first memory addressing means responsive to odd integer values of said sequence of harmonic numbers whereby elements of said first set of harmonic coefficients are read out from said first harmonic coefficient means at memory addresses having an odd numerical value,

a second memory addressing means responsive to said sequence of harmonic numbers for reading out elements of said second set of harmonic coefficients from said second harmonic coefficient memory means,

a means for computing responsive to said elements of said first set of harmonic coefficients read out from said first harmonic coefficient means whereby a first master data set of waveshape data points are generated and stored in said first waveshape memory means, and wherein said means for computing is also responsive to said elements of said second set of harmonic coefficients read out from said second harmonic coefficient means whereby a second master data set of waveshape data points are generated and stored in said second waveshape memory means, and

a means for producing musical tones wherein each tone is a combination of data points read out of said first waveshape memory means at a first frequency and data points simultaneously read out at a second frequency from said second waveshape memory means and in phase coherence with the data points read out from said first waveshape memory means whereby said musical tones produced from said combination has an extended number of harmonics equal in number to two times the number of harmonic coefficients comprising said second set of harmonic coefficients.

4,526,082

ELECTRIC BOW FOR THE ELECTRIC BASS GUITAR

Charles A. Ables, 513-14th Street, NE., Washington, D.C. 20002

Filed Jul. 5, 1983, Ser. No. 476,132

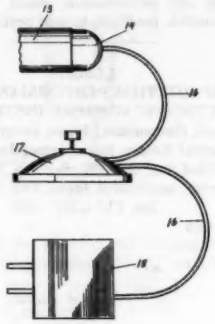
Int. Cl.³ G10D *3/16*

U.S. Cl. 84—325 **4 Claims**

1. An electric bow device for bowing a plural stringed electric bass guitar comprising: a cylinder head housing an electric motor with rotatable shaft,

a handle grip attached to said housing, and a tail piece attached to said grip, said grip and tail piece adapted to enclose electrical wiring for said motor, said handle grip adapted to be held in a hand of a user, said device being adapted for holstering when said device is not in use,

a cone shaped bow means attached to said shaft of said motor, said bow means rotating when said motor is energized and said shaft is rotating, said bow means so dimensioned as to enable a user to place the bow means between two strings and bow one or both of said two strings or to



place the bow means on top of said strings and bow as many as four strings.

4,526,083

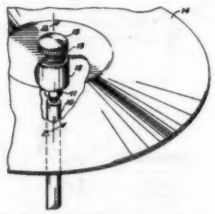
CYMBAL MOUNTING FIXTURE

Alfred J. LeMert, 5565 Bolla Ct. SW., Ft. Myers, Fla. 33907

Filed Jul. 6, 1984, Ser. No. 628,526

Int. Cl.³ G10G *5/00*

U.S. Cl. 84—421 **6 Claims**



1. Apparatus for mounting a cymbal on the threaded end of a cymbal stand comprising:

a fitting having a generally cylindrical body of resilient material into one end of which is embedded an axial plug, said plug being internally threaded to fit onto the threaded end of a cymbal stand, and onto the opposite end of which fitting is attached and externally threaded shaft,

a shouldered washer designed to fit snugly about the shaft of said fitting, the shoulder of said washer having an outer diameter of approximately one half inch and a thickness of approximately one sixteenth of an inch, and

a knob having an internally threaded hole and a generally flat lower face surrounding said threaded hole designed to be screwed down upon the shaft of said fitting.

4,526,084

SHELL LOADER

Donald M. David, and Gene R. Morris, both of Grand Island, Nebr., assignors to Hornady Manufacturing Co., Grand Island, Nebr.

Filed Sep. 23, 1983, Ser. No. 535,223

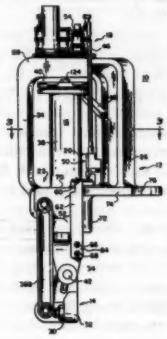
Int. Cl.³ F42B *33/10*

U.S. Cl. 86—38 **19 Claims**

1. Reloading apparatus comprising:

carriage means adapted to support a shell holder having a number of positions each of which may hold a separate casing;

a punch for removing a spent primer at a first location;
a priming station at a second location;
means for moving the carriage means vertically between the first location and the second location whereby the spent primer may be removed at the first location and a new one inserted at the second location;
means for holding a supply of primers having a hollow vertical elongated column adapted to receive said primers one above the other for gravity feeding thereof;
lever means having a cam follower on one end, a primer holder on the other end and a pivot point located between its two ends for moving said primers one at a time to the second location mounted in juxtaposition with said second location;
said carriage means including means for carrying a cam into engagement with said cam follower, whereby a primer is inserted in said location by the motion of said carriage means;
means for moving said shell holder from position to position successively in a horizontal plane whereby each shell is deprimed and primed during the movement of said carriage between said first position and said second position;
said shell holder having a rim extending beyond the carriage means a sufficient distance to receive the primer thereunder;
the distance from the edge of the rim to the location of said means for holding being at least one-half the diameter of a shell;



said primer holder including a primer punch and seat assembly;
spring means for biasing the primer punch and seat assembly to one and one-half inches from the center of the shell holder;
the length of the primer moving section being sufficient to swing under action of the cam follower through an arc that brings it underneath the means for holding;
the priming station includes a horizontal support plane;
the primer punch and seat assembly being supported by a compression spring at a height of approximately one fourth of an inch from the support plane;
the means for holding including an opening positioned to receive the primer punch and seat assembly extending from the support plane to an elevation from the bottom of the support plane slightly less than a quarter of an inch to permit removal of the primer;
the cam follower is shaped so that when it is moved by the cam surface, the primer punch and seat assembly is swung on the primer moving section through the distance between the second location and the means for holding to receive a primer through an arc of approximately 30 degrees;
the distance from the center of the primer punch and seat assembly and the center of the pivot point being two and one-fourth inches;
the distance to the cam follower at the start of motion upwardly being approximately one-half of an inch; and
said lever means being mounted for motion under the driving force of said cam follower in a direction at an angle to the direction of motion of the carriage within the range of 170 thousandths of an inch to six inches.

4,526,085

HYDRAULIC LOADING SHOVELS

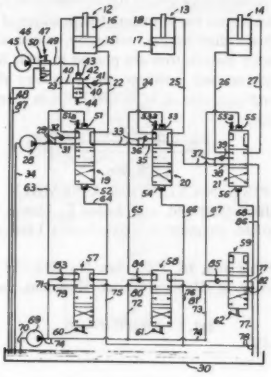
Jean Y. H. Morizur, Compiegne, and Victor Yeou, Meau, both of France, assignors to Poclain, Le Plesses Belleville, France

Continuation of Ser. No. 126,126, Feb. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 808,442, Jun. 21, 1977, abandoned. This application Aug. 13, 1982, Ser. No. 408,017

Claims priority, application France, Jul. 6, 1976, 76 20658

Int. Cl.[3] **F01B** *25/02*

U.S. Cl. 91—6 **6 Claims**



1. A device for controlling at least first and second fluid-controlled drive members wherein the first drive member is double-acting and has separate small and large chambers of unequal useful sections, including:
first and second main distributors respectively associated with said first and second drive members,
first and second supply conduits each respectively connecting one of said small and large chambers of the first drive member to the first main distributor,
at least one main source of pressurized fluid,
a plurality of conduits connecting said main source to each distributor, said first distributor being movable to first, second, and third positions, in which in said first position the small chamber of the first drive member communicates with the main source associated therewith, in the second position the two chambers of said first drive member are isolated, and in the third position the large chamber communicates with said main source, said second drive member having at least one chamber, a supply conduit connecting said one chamber to the second main distributor, said second main distributor being movable to at least first and second positions respectively placing said chamber of the second drive member in communication with said main source and isolating that chamber from said main source, a communication conduit connecting the first and second supply conduits of the first drive member and non-return valve means disposed in said communication conduit for allowing the passage through the communication conduit of fluid only from the small chamber towards the large chamber of this first drive member in response to extremely low pressure differentials, and preventing passage of fluid from the large cham-

ber towards the small chamber of the first drive member through the communication conduit,

a two-position selector disposed in said communication conduit and which, in a first position ensures the continuity of this communication conduit, and in a second position obturates said communication conduit to flow of fluid in either direction therein, and

a two-way distributor disposed in the supply conduit of the large chamber of the first drive member and connected, via a by-pass conduit to the supply conduit of said chamber of the second drive member, said two-way distributor being movable between first and second positions and interrupting, in its first position, said supply conduit of the large chamber of the first drive member, placing that part of the supply conduit connected to said large chamber in communication with the by-pass conduit and ensuring, in its second position, the continuity of the supply conduit of the large chamber of the first drive member; said two-way distributor including means for adjusting its position combined with means for adjusting the position of the first and second main distributors, whereby, when the first and second main distributors are placed in their first position, or in their second position, the two-way distributor is correspondingly placed in its first or in its second position, respectively.

4,526,086

PISTON-CYLINDER ASSEMBLY

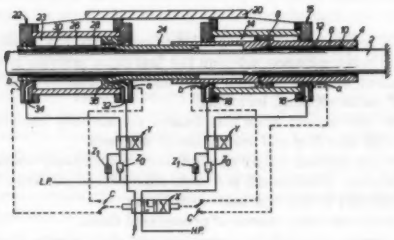
James A. Holton, Sheffield, and James C. Inman, Rotherham, both of England, assignors to Davy-Loewy Limited, Sheffield, England

Filed Jun. 16, 1982, Ser. No. 388,922

Claims priority, application United Kingdom, Jun. 17, 1981, 8118605

Int. Cl.³ F15B *15/26*

U.S. Cl. 91—43 **16 Claims**



1. A piston-cylinder assembly, comprising:

a rod;

a pair of pistons relatively movable with respect to said rod;

clamping means for clamping each of said pair of pistons to said rod;

a pair of cylinders, relatively movable with respect to said rod, for housing said pair of pistons, respectively;

means for introducing and exhausting pressurized fluid to and from said pair of cylinders and said pair of piston clamping means; and

means cyclically controlling the flow of said pressurized fluid to and from said pair of cylinders and said pair of piston clamping means for moving said pair of pistons relative to said pair of cylinders and sequentially actuating only a first one of said pair of piston clamping means, both of said pair of piston clamping means, only the second one of said pair of piston clamping means, both of said pair of piston clamping means, and only said first one of said pair of piston clamping means, so as to provide said relative movement between said pair of cylinders and said rod.

4,526,087

CONTROL MECHANISM FOR A TRIDIMENSIONAL CAM

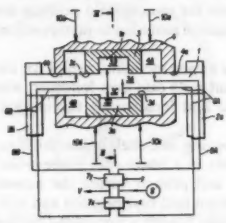
Guy d'Agostino, Vitry; André Dhainaut, Dammarie les Lys, and Claude M. J. Maillard, Vulaines sur Seine, all of France, assignors to S.N.E.C.M.A., Paris, France

Filed Feb. 14, 1983, Ser. No. 466,029

Claims priority, application France, Feb. 12, 1982, 82 02289

Int. Cl.³ F01B *15/00*

U.S. Cl. 91—61 **8 Claims**



1. A control mechanism for a tridimensional cam comprising:

a substantially cylindrical tridimensional cam embodied by contours of an approximately cylindrical surface;

a fixed central rod;

a linear jack supporting said tridimensional cam and mounted on said central rod for rotational and translational movement thereon;

a rotating jack disposed within the body of said linear jack, said rotating jack being rotatably mounted on said central rod and mounted against translation thereon, said linear jack being mounted for translation along said rotating jack, wherein said rotating jack further comprises fluid piston means for producing said translation of said linear jack;

a key and a groove for fixing said rotating jack and said linear jack against relative rotation;

an even number of rotary control chambers disposed between said rotating jack and said central rod, said rotary control chambers being formed in part by a plurality of radial partitions equal in number to the number of said rotary control chambers, wherein said rotary control chambers further comprise means for rotationally driving said rotating jack;

means for supplying fluid to said fluid piston means,

means for supplying fluid to said rotary control chambers, and

control means for independently controlling said means for supplying fluid to said fluid piston means and said means for supplying fluid to said rotary control chambers.

4,526,088

FLUID-OPERATED ACTUATING DEVICE

Hermann Reuschenbach, Rossbach;, and Egon Sentinger, Koblenz, both of Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Division of Ser. No. 256,936, Apr. 23, 1981, abandoned. This application Nov. 26, 1982, Ser. No. 444,828

Claims priority, application Fed. Rep. of Germany, May 7, 1980, 3017403

Int. Cl.³ F15B *15/22*

U.S. Cl. 92—12 **20 Claims**

1. In a fluid-operating actuating device comprising an actuating cylinder member having an axis and two ends and defining therewith an actuating cavity; an axially movable actuating piston rod member extending in sealing relation through at least one of said two ends of the actuating cylinder member; an actuating piston carried by said actuating piston rod member and defining two actuating chambers within said actuating

cavity; actuating fluid connection means for introducing actuating fluid to and removing actuating fluid from said actuating chambers; and damping means for damping axial movement of said actuating piston rod member relative to said actuating cylinder member, said damping means comprising:

(1) said actuating piston rod member comprising a cylindrical member having an axis and two ends and defining a damping cavity therewithin;

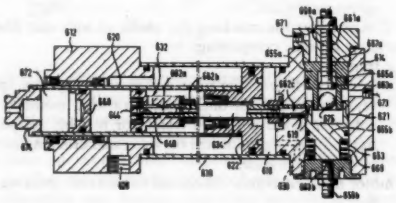
(2) a damping piston unit axially movable within said damping cavity in sealing engagement with the interior surface of said actuating piston rod member and defining two damping chambers within said damping cavity;

(3) a damping piston rod member connected to said damping piston unit, said damping piston rod member extending in sealing relation through at least one end of said actuating piston rod member and being connected to said actuating cylinder member;

(4) a self-contained damping fluid sealed within said damping cavity;

(5) flow passage means connecting said two damping chambers and extending through said damping piston unit;

(6) damping valve means associated with said flow passage means for varying the flow cross-section of said flow passage means;



(7) valve operating means associated with said damping valve means for controlling said damping valve means from outside said damping cavity, said valve operating means comprising rod means passing through an axial bore in said damping piston rod member, said rod means adjacent its end remote from said damping valve means being operatively connected to adjusting means provided at said at least one end of said actuating piston rod member;

the improvement comprising:

(a) the flow cross-section defined by said damping valve means being variable by axial movement of said rod means;

(b) said rod means being provided with an engagement face at said remote end thereof; and

(c) biasing means being provided for urging said engagement face towards engagement with a continuously adjustable counterengagement face of said adjusting means, said counterengagement face being defined by a counterengagement member movable with respect to said damping piston rod member by a fluidic drive means, the range of movement of said counterengagement member being defined by at least one adjustable abutment member.

4,526,089

VACUUM BOOSTER DEVICE

Hiroo Takeuchi, Asashina, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Feb. 11, 1982, Ser. No. 347,792

Claims priority, application Japan, Jul. 1, 1981, 56-103751

Int. Cl.³ F01B *19/00*; F15B *9/10*

U.S. Cl. 92—98 D **10 Claims**

1. In an improved vacuum booster device comprising:

a booster shell;

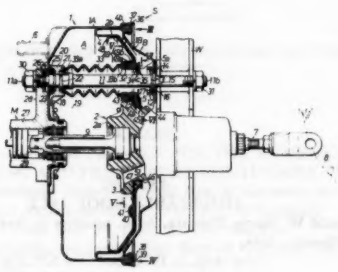
a booster piston axially slidably accommodated in said booster shell and having a central boos portion and a disc portion around the outer circumference of said central boss portion;

a diaphragm superposed on the rear surface of said disc portion of said booster piston and having an inner circumferential bead fitted to said central boss portion and an outer circumferential bead fitted to the circumferential wall of said booster shell;

said booster piston and said diaphragm together dividing the interior of said booster shell into a front side first working chamber in communication with a vacuum supply source and a rear side second working chamber selectively in communication with said first working chamber or the atmosphere via a control valve operatively connected to an input member;

tie rods extending through through-holes provided in said disc portion of said booster piston and through-holes provided in said diaphragm for connection of the front and rear walls of said booster shell with each other; and

seal means for the through-holes in said disc portion through which said tie rods extend;



the improvement wherein said booster piston is divided into the central boss portion having a flange protrusively around the outer circumference thereof and the disc portion which is separate from the central boss portion and is placed in contact with the rear surface of said flange, a retainer member is secured to the outer circumference of said central boss portion and clamps said disc portion and said inner circumferential bead of said diaphragm between said flange and said retainer member, and a resilient push plate is integrally formed with said retainer member and presses the diaphragm in a peripheral portion thereof around each said through-hole in the diaphragm against said disc portion, said disc portion having a front surface and including short cylindrical portions formed integrally with said disc portion and projecting from said front surface thereof, each said short cylindrical portion forming a respective said through-hole of said disc portion and being engaged with a respective locating slit provided at the outer circumferential surface of said flange.

4,526,090

FLEXIBLE CONDUIT TAKE-UP APPARATUS

Robert L. Maier, Atherton, Calif., assignor to McCormick Morgan, Inc., San Francisco, Calif.

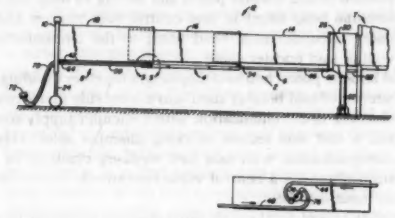
Filed Feb. 2, 1984, Ser. No. 576,052

Int. Cl.³ F24F *7/007*

U.S. Cl. 98—33.1 **27 Claims**

18. Apparatus for supporting a flexible hose adjacent a telescoping structure comprising:

a tray having a bottom for supporting said hose thereon; means for attaching said tray to said structure; and



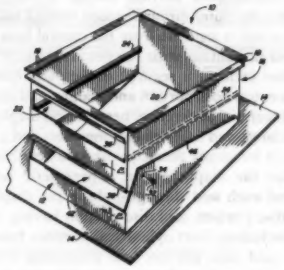
a generally Z-shaped fluid connection member, said connection member spliced medially along said hose and mounted to said bottom of said tray.

4,526,091

ADJUSTABLE ROOF JACK

Donald W. Sharp, Phoenix, Ariz., assignor to Reynalda Clack, Phoenix, Ariz.

Filed Aug. 2, 1984, Ser. No. 637,122
Int. Cl.³ F24F *13/02*; E04B *7/18*
U.S. Cl. 98—39.1 **3 Claims**



1. A slope adjustable roof jack for connecting a roof mounted air handler to a duct which emerges from and through the roof, the roof having a slope lying within a predetermined range of slopes, the roof jack comprising:

a first rectangular ductlike assembly for attachment at a lower end thereof to the roof and to the emerging duct;

a second rectanglular ductlike assembly for attachment at an upper end thereof to an output of the air handler;

bendable means for providing a weatherproof hinged connection between one side of said first assembly and the corresponding side of said second assembly and for adjusting an angular relationship between said first assembly and said second assembly, said angular relationship being a function of the slope of the roof; and

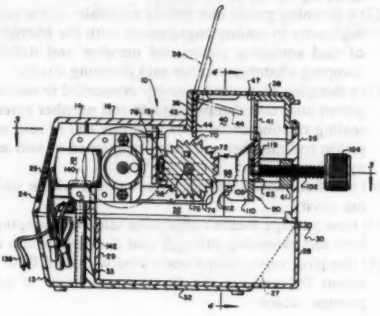
a single continuous sheet of material comprises said one side of said first assembly, said corresponding side of said second assembly and said bendable means.

4,526,092

ADJUSTABLE POWERED NUTCRACKER

Abraham J. Greenblatt, 6722 Waggoner Dr., Dallas, Tex. 75230, and Joon S. Kim, 6873 Winchester, Dallas, Tex. 75231

Filed Mar. 9, 1984, Ser. No. 588,125
Int. Cl.³ A23N *5/00*
U.S. Cl. 99—575 **13 Claims**



1. Apparatus for cracking the shells of nuts and like shell enclosed kernels, comprising:

a frame;

a pair of shell cracking members mounted spaced apart on said frame, at least one of said cracking members being rotatable relative to said frame for forcibly propelling a nut through a gap formed between said cracking members to crack said shell;

motor means drivably connected to said one cracking member;

at least one of said cracking members comprising a movable cracking member being movable relative to said frame and the other cracking member to vary the width of said gap;

gauge means on said frame comprising a pair of jaws mounted on said apparatus, one of said jaws being mounted stationary relative to and spaced apart from said cracking members and the other of said jaws being operably connected to and spaced apart from said movable cracking member and movable with said movable cracking member to a predetermined position relative to said one jaw and corresponding to the distance between said cracking members for gauging the overall outer width of a nut shell so that a predetermined spacing of said cracking members may be set without placing a nut between said cracking members to set the width of said gap for cracking said shell upon passing said shell between said cracking members; and

means for moving said movable cracking member and said other jaw simultaneously to set the width of said gap.

4,526,093

APPARATUS FOR PROCESSING POTATOES

Richard D. Fogerson, Ontario, Oreg., assignor to Ore-Ida Foods, Inc., Boise, Id.

Filed Apr. 20, 1984, Ser. No. 602,518
Int. Cl.³ A23N *7/00*
U.S. Cl. 99—584 **11 Claims**

1. Apparatus for preparation of potato skins from cut baked potatoes comprising

a first stationary cylindrical drum,

a continuous roller chain conveyor means arranged to travel around part of the outer wall of said drum and having a plurality of tray assemblies connected thereto at predetermined spaced apart positions along the length of said conveyor means,

said tray assemblies extending axially across said drum and generally parallel to the central axis thereof,

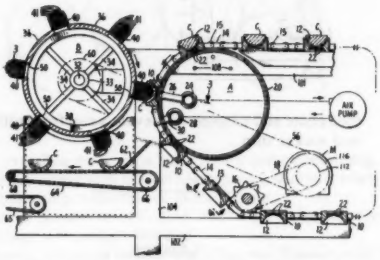
at least one cup shaped mold forming part of each of said tray assemblies and shaped to receive part of a potato for processing,

a vacuum means associated with each said cup shaped mold for firmly holding said potato part therein during said processing,

a pressure means associated with each said cup for positively discharging a processed potato shell,

a second drum adapted to rotate about its central axis,

said first and said second drum being in spaced parallel relation to each other over the respective portions thereof positioned adjacent to each other,



a plurality of knife assemblies attached to the outer wall of said second drum at predetermined radially spaced apart positions corresponding to the spacing of said positions of said tray assemblies associated with said first drum,

at least one cutter unit comprising a plurality of spaced parallel arcuate blades mounted on each of said knife assemblies and having open slots between and beneath said blades, and

means for synchronizing the movement of said tray assemblies about said first stationary drum with the movement of said knife assemblies about said second rotary drum whereby said cup shaped molds and said cutter units meet to scoop potato meat from said potato part.

4,526,094

PROCESS AND DEVICE FOR PACKING STAPLE FIBERS INTO BALES

Siegfried Rewitzer, Ihrlerstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

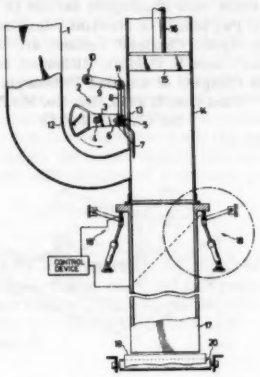
Filed Dec. 28, 1983, Ser. No. 566,173

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1982, 3248712; Nov. 19, 1983, 3341882

Int. Cl.³ B30B *15/30*

U.S. Cl. 100—35 **10 Claims**

1. In a process for packing staple fibers into bale form by multistage pressing which involves introducing the staple fibers by means of a clearing device in pushsized batches into a transportable press container and precompacting each time the amount of fiber from several pushes by the clearing device by means of a pressing ram and then subjecting the filled transportable press container to a final pressing in a central press, the improvement comprising first of all subjecting the empty press container to a weighing in which the press container is freed from touching sealing devices, lifted by lifting devices and weighed by load-measuring devices mounted thereon, and the press container is then put down again, the sealing devices are closed and the lifting devices are pivoted out, then starting with the usual filling and precompacting, the number of clearing motions being monitored, determining the weight and the average weight of staple fibers per a clearing motion after a predetermined number of clearing motions, and therefrom calculating the number of clearing motions or pushes still required for reaching a target weight, and then carrying out



these motions or pushes in conventional manner until the target weight is reached.

4,526,095

PROCESS AND APPARATUS FOR THE AUTOMATIC DEPOSITING AND PRESSING OF CONTINUOUS TOWS

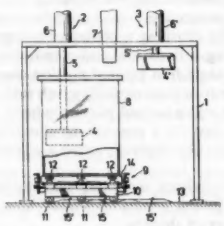
Siegfried Rewitzer, Ihrlerstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 28, 1983, Ser. No. 566,171

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1982, 3248711

Int. Cl.³ B30B *13/00*

U.S. Cl. 100—39 **7 Claims**



1. In a process for depositing and pressing continuous tows in which a continuous tow is deposited in zigzag layers into an open-ended container through a pivotable chute, moving a container transversely to the chute by means of a traversing device, and exposing the deposited tow to the effect of respective press rams at each end point of the traversing movement, the improvement comprising the steps of introducing an empty container onto the traversing device, transferring the starting end of a continuous tow to a catch box positioned adjacent the open-ended empty container, weighing the container and its contents during each traversing movement thereof, stopping the further deposition of the continuous tow into the container when a predetermined tow weight is reached, severing the tow and fixing the tow ends thus formed by the sever to prevent them from unraveling, depositing the starting end of the continuous tow from the catch box into the open-ended container after the severing and fixing steps, and removing the open-ended container and its tow contents from the traversing device.

4,526,096

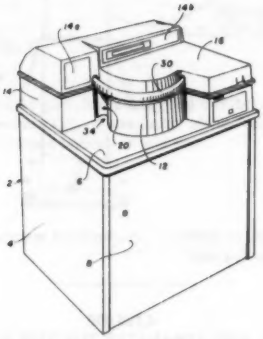
APPARATUS FOR PROCESSING USED CONTAINERS HAVING IMPROVED CRUSHER MEANS

Robert L. La Barge, Ben Avon; Thomas W. Scherf, Vandergrift; Eric D. Arndt, New Kensington; Jerrold D. Green, Murrysville, all of Pa.; Ronald G. Hawkins, Massena, N.Y.; Frank J. Horansky, Apollo; Charles J. Leftault, Jr., Murrysville, both of Pa., and Elmer E. Pohlenz, Richmond, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 8, 1983, Ser. No. 559,321

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—53 **11 Claims**



1. Apparatus for the processing of used containers comprising:

(a) a frame and an enclosure;

(b) a manually operated rotatable carrier operationally attached to said frame;

(c) at least one container receiving station associated with said carrier;

(d) means for preventing rotation of said carrier until the insertion of a container therein;

(e) means for detecting the presence of a container acceptable for processing in said container receiving station;

(f) means for crushing a container accepted for processing comprising a fixed jaw and a movable jaw, one of said jaws having a first tapered portion capable of engaging a container to at least partially crush said container between said jaws and a second portion wherin movement of said movable jaw to a position substantially parallel to said fixed jaw will completely crush a container therebetween; and

(g) means for shock mounting said crushing means to said frame to inhibit vibration of said frame and said detection means carried thereby.

4,526,097

FEED MECHANISM FOR APPARATUS FOR EVACUATING AND COMPACTING AEROSOL CANS

Cary D. Cound, La Puente, Calif., assignor to American Home Products Corporation, New York, N.Y.

Filed Jun. 1, 1983, Ser. No. 499,959

Int. Cl.³ B30B *15/30*

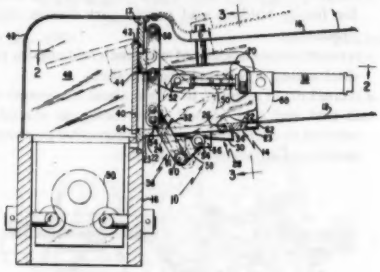
U.S. Cl. 100—215 **7 Claims**

1. In an apparatus for evacuating and compacting aerosol cans, the improved feed mechanism connected to a feed chute comprising:

A. a bottom plate;

B. a rocker stop assembly including a rocker stop removably connected to said bottom plate;

C. first means connected to said rocker stop assembly to move said rocker stop between a first position and a second position, whereby in said first position a first can in position for discharge is restrained from discharge and in said second position said first can is discharged and a second can is restrained from entering the discharge position, and a suppression plate movably connected to the



feed chute and adapted to prevent a can from rolling over said rocker stop.

4,526,098

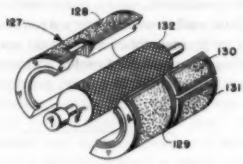
LASER FORMED ROTARY PRINT PLATE WITH INTERNAL SINTERED TITANIUM INK RESERVOIR

Burl A. Bachman, Strongsville, Ohio, assignor to DL Process Co., Wheat Ridge, Colo.

Continuation-in-part of Ser. No. 770,418, Feb. 22, 1977, abandoned. This application Jan. 4, 1980, Ser. No. 110,133

Int. Cl.³ B41F *15/04*

U.S. Cl. 101—115 **9 Claims**

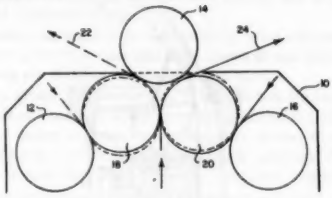


1. In a high speed rotary printing press for reproducing an image on a substrate, the combination of a porous reservoir for pigmented fluid having at least one porous surface, a printing plate mounted and supported by said reservoir and cooperating therewith, said printing plate having a plurality of spaced minute openings therein to form the image on the substrate by transfer of pigmented fluid from said minute openings directly to the substrate when the latter contacts said printing plate, said minute openings being arranged in a grid pattern on said printing plate to define the shape and density of the image, means for supplying under controlled pressure pigmented fluid to said porous reservoir for passing pigmented fluid to said minute openings for transfer therefrom directly to the substrate, said one porous surface of said reservoir comprising a section of a cylinder, said pigmented fluid being supplied in the hollow interior thereof, said printing plate comprising a relatively flexible material for mounting the same on the cylindrical porous surface said reservoir comprising a material forming said one porous surface that is permeable to such pigmented fluid, said material delivering a highly uniform distribution of pigmented fluid throughout the entire porous surface thereof to said printing plate for passage through said minute openings directly onto a surface for printing an image thereon, said reservoir comprising sintered titanium metal having a porosity on the order of about the size of said minute openings.

4,526,099
REVERSIBLE COLOR DECK FOR ROTARY PRINTING PRESSES

Thaddeus A. Niemiro, Lisle, and Daniel F. Machaj, Hinsdale, both of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 16, 1983, Ser. No. 466,827
Int. Cl.³ B41F *5/08*
U.S. Cl. 101—220 **4 Claims**

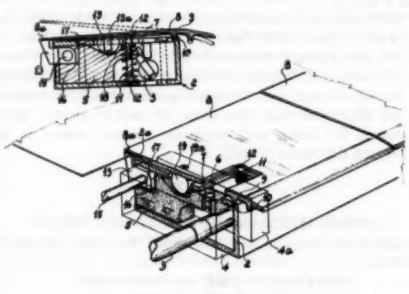


1. A reversible color deck for a rotary press comprising:
(a) three delivering rolls spaced apart in a substantially triangular relationship with respect to each other;
(b) a pair of blanket rolls located within the space separating said image delivering rolls; and
(c) eccentric mounting means supporting said blanket rolls for effecting simultaneous movement of the latter between positions where:
(i) a first one of said blanket rolls is in contact with two of said image delivering rolls and the second one of said blanket rolls is in contact with the remaining one of said image delivering rolls;
(ii) neither of said blanket rolls is in contact with any of said image delivering rolls; and
(iii) said second blanket roll is in contact with two of said image delivering rolls and said first blanket roll is in contact with the remaining one of said image delivering rolls.

4,526,100
GRIPPER DEVICE FOR TRANSPORTING AND REGISTERING PLATES OR SHEETS TO BE OVERPRINTED ON SILK SCREEN PRINTING MACHINES IN ONE OR MORE COLORS

Umberto Brasa, Milan, Italy, assignor to Siasprint S.r.l., Milan, Italy

Filed May 9, 1984, Ser. No. 608,646
Claims priority, application Italy, May 20, 1983, 21212 A/83
Int. Cl.³ B41F *1/28, 1/36;* B41L *21/06, 21/12*
U.S. Cl. 101—408 **6 Claims**

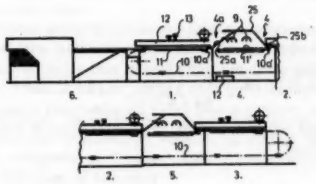


1. A gripper device for transporting and registering sheets and plates in single or multicolor silk screen printers, comprising a box-like supporting body having hingedly connected thereto a plate-like element forming a flat jaw, a preloaded spring member biased against said plate-like element, a plurality of flat surface mutually aligned gripping elements set for oscillation about an axis parallel to the axis of rotation of said plate-like element and actuated to close against said flat jaw by at least one slide element, reciprocatingly driven by a drive shaft from the silk screen printer, contacting said gripping elements, said slide element being provided with an actuating means cooperating with a means associated with said flat jaw and plurality of juxtaposed gripping elements operative to produce, as said slide is being reciprocated, a rotation of said plurality of gripping elements about their own axes toward said flat jaw and to allow disengagement of said flat jaw from said slide, and accordingly the closure thereof, through said spring members, against said plurality of juxtaposed gripping elements.

4,526,101
ARRANGEMENT FOR DRYING PRINTED MATERIAL

Sylve J. D. Ericsson, Tolléns väg 8, 147 00 Tumba, Sweden

Filed Oct. 14, 1983, Ser. No. 541,970
Int. Cl.³ D41F *23/00;* F26B *3/28*
U.S. Cl. 101—416 R **7 Claims**



1. An arrangement including at least one drying station for drying print deposited on material received from a printing machine, said drying station comprising conveyor means for conveying material along a path through the drying station, said conveyor means including a plurality of gripping bars which are spaced apart according to a predetermined path-length, said gripping bars extending transversely with respect to said path, a source of radiation for print-drying, and control means for intermittently operating said plurality of gripper bars and for intermittently energizing the source of radiation for drying said print during a period of time when wet print coating said material is adjacent said source of radiation, wherein said drying station is provided with a hood positioned about said source of radiation, said hood having an infeed opening and an outfeed opening for receiving and discharging, respectively, printed material, said infeed opening and said outfeed opening being spaced apart according to said path-length, said plurality of gripper bars being driven intermittently such that members of said plurality of gripper bars are registered with said infeed opening and said outfeed opening when said source of radiation is energized for drying said print so that said members substantially prevent the passage of light and heat through said infeed opening and said outfeed opening.

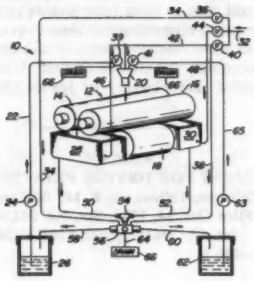
4,526,102
INK CIRCULATION AND WASH UP SYSTEM FOR A PRESS

William Grobman, Philadelphia, Pa., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Oct. 31, 1983, Ser. No. 547,535
Int. Cl.³ B41F *35/04*
U.S. Cl. 101—425 **13 Claims**

1. A system for distributing a liquid printing medium and a wash liquid in a printing press having elongated printing medium application means supported by the press, a plurality of discrete printing medium supply means for sequentially supplying a printing medium to said application means, a receptacle positioned adjacent each end of said application means to

receive any excess printing medium therefrom, each of said receptacles having a single outlet, conduit means connecting each receptacle with a wash liquid supply means for selectively introducing a wash liquid into said receptacles, a valve below the elevation of said receptacles, said valve having a single inlet and plural outlets, discharge conduits connecting each of said receptacle outlets to the inlet of said valve, one valve



outlet communicating with one of said printing medium supply means, another valve outlet communicating with another of said printing medium supply means, said valve having another outlet communicating with a drain, and an actuator coupled to a movable member in said valve for selectively connecting the inlet of said valve to a drain or to either one of said printing supply means.

4,526,103

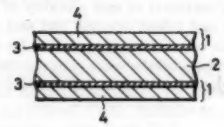
ALUMINUM COATED STEEL SUPPORT FOR PLANOGRAPHIC PLATE

Michio Kubota, Amagasaki, and Takeshi Shoji, Tokyo, both of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1982, Ser. No. 364,897

Int. Cl.[2] B41N *1/08*

U.S. Cl. 101—459 **3 Claims**



1. A planographic plate having an image-receiving layer on its surface, which comprises: a steel plate having a thickness of from about 0.15 mm to about 0.25 mm and hot-dip aluminized on each side by passing the steel plate through a bath consisting essentially of molten aluminum and from 1% to 10% silicon to provide an aluminized plate, and made by cold rolling said aluminized plate at a rolling reduction of 30% to 85% in total, the aluminized layer of said plate comprising an inner alloy layer of from about 0.2 to about 5 microns thickness and an outer aluminum layer of more than 7 microns thickness after cold rolling.

4,526,104

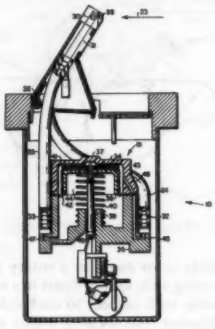
SAFETY-ARMING DEVICE

Larry F. Brauer, and Roger W. Leach, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 14, 1982, Ser. No. 434,438

Int. Cl.[3] F42C *5/00, 15/32*

U.S. Cl. 102—228 **9 Claims**



1. A safety-arming, S-A, device for mounting in a munition requiring two firing pulses comprising:

(a) a housing with an environmental seal;

(b) means for removing said environmental seal from said housing upon deployment of said S-A device;

(c) a spring loaded pressure probe pivotally mounted within said housing, said pressure probe having a dynamic port;

(d) a latch mechanism connected to said spring loaded pressure probe such that when activated, said latch mechanism moves said spring loaded pressure probe from a stored position within said housing to an extended position where said dynamic port is external to said housing;

(e) actuating means receiving air pressure from said pressue probe, said actuating means having a piston responsive to a sufficient pressure differential between said static and dynamic air pressure, said piston driving an actuator rod;

(f) a rotor assembly having at least two detonator wheels, each detonator wheel containing detonator means and detonator switch means, said rotor having a safe and an arm position;

(g) an arming spring attached to said actuator rod and said rotor assembly such that, upon displacement of said actuator rod by said piston, said arming spring is compressed so as to provide motive force to rotate said rotor assembly from said safe to said arm position; and

(h) a timing delay circuit electrically connected to both of said detonator switch means when said rotor assembly is in said arm position whereby a first firing pulse is transmitted after a first time delay to said detonator switch means for firing said detonator means located in said first detonator wheel, and whereby a second firing pulse is transmitted after a second time delay to said detonator switch means for firing said detonator means located in said second detonator wheel.

4,526,105

FIRING MECHANISM FOR PROJECTILES

Thomas W. Herren, Jr., 6611 Dearborn Dr., Falls Church, Va. 22044

Filed Jul. 22, 1983, Ser. No. 516,405

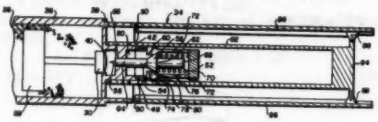
Int. Cl.[3] F42B *13/20*

U.S. Cl. 102—498 **20 Claims**

1. An improved projectile, comprising:

an elongated tubular body having a forward chamber and an aft chamber;

a propellant grain positioned in said aft chamber;
means separating said aft chamber from said forward chamber for permitting passage of combustion gases from said aft chamber into said forward chamber as said propellant grain burns out during flight of said projectile;
a nose portion slidably received at least partially in said forward chamber and adapted to be expelled from said forward chamber by said combustion gases, said nose portion comprising an explosive charge and a primer for said explosive charge;
a housing having a bore, said housing being attached to said nose portion so that said bore opens at said primer;
a firing pin slidably received in said bore;
spring means for biasing said firing pin toward said primer;
at least one resilient detent member attached to said housing, said detent member being normally biased to a radially outward position out of engagement with said firing pin;
slider means for forcing said at least one resilient detent member radially inwardly to engage and hold said firing pin against the action of said spring means in a safety position away from said primer; and
means actuated upon expulsion of said nose portion for moving said slider means relative to said detent member to release said detent member from engagement with said



firing pin, whereby said firing pin is driven into said primer by said spring means.

11. An improved firing mechanism for a projectile of the type having a nose portion which separates in flight from the remainder of the projectile and which includes an explosive charge and a primer for said explosive charge, said mechanism comprising:
a housing having a bore, said housing being adapted for attachment to said nose portion so that said bore opens at said primer;
a firing pin slidably received in said bore,
spring means for biasing said firing pin toward said primer;
at least one resilient detent member attached to said housing, said detent member being normally biased to a radially outward position out of engagement with said firing pin;
slider means for forcing said at least one resilient detent member radially inwardly to engage and hold said firing pin against the action of said spring means in a safety position away from said primer; and
means actuated upon separation of said nose portion for moving said slider means relative to said detent member to release said detent member from engagement with said firing pin, whereby said firing pin is driven into said primer by said spring means.

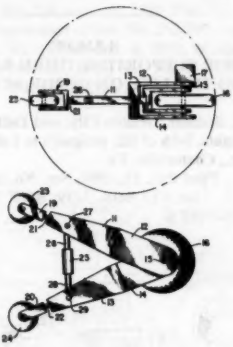
4,526,106

THREE-WHEELED ADJUSTABLE VEHICLE

Tokuji Okada, and Takeo Kanade, both of Pittsburgh, Pa., assignors to Carnegie-Mellon University, Pittsburgh, Pa.

Filed Oct. 11, 1983, Ser. No. 540,179
Int. Cl.³ B61B *13/10*
U.S. Cl. 104—138 G **7 Claims**

1. A vehicle for automatically following the center line of a pipe comprising a pair of arms connected at one pair of ends about a pivot, a driving wheel mounted to rotate about an axle at the pivoted ends of said arms in the plane of said arms, a swiveling wheel mounted at the free end of each arm, and



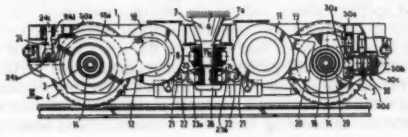
means connected between the arms urging them to pivot towards each other.

4,526,107

RAILWAY TRUCK FOR SELF-PROPELLED RAILWAY VEHICLES

Franz Mautner, Munich; Peter Schwarzler, Fürstenfeldbruck, and Manfred Mittermaier, Munich, all of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 30, 1982, Ser. No. 403,704
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130603
Int. Cl.³ B61B *9/38*
U.S. Cl. 105—133 **7 Claims**



1. A railroad truck assembly comprising:
a vehicle chassis;
a pivot pin extending downwardly from said chassis;
a support frame below said chassis angularly displaceable about and connected to said pivot pin;
at least two wheel sets, each including a pair of wheels and a wheel axle mounted in said frame;
a primary spring suspension between said axle and said frame;
a secondary spring suspension between said frame and said chassis;
at least two drive trains each including a motor and gearing applying drive forces to one wheel of a corresponding wheel set;
respective first pivot means for each drive train articulated to one end of the respective drive train and rotatably supported on said support frame whereby a first portion of the weight of each drive train is transferred to said support frame thus being resiliently suspended by said primary spring suspension; and
respective second pivot means for each drive train articulated to the other end of the respective drive train and rotatably supported on said pin together with the second pivot means of the other drive train whereby a second portion of the weight of each drive train is transferred to

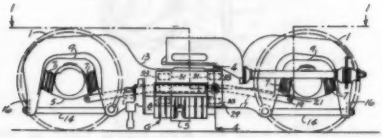
said chassis through said pin thus being resiliently suspended by said secondary spring suspension, each of said pivot means defining a pair of mutually perpendicular pivot axes.

4,526,108

MEANS FOR SUPPORTING THIRD RAIL COLLECTOR GEAR AND THE LIKE ON INSIDE BEARING RAILWAY TRUCKS

Kenneth E. Spencer, Granite City, and Dallas L. Schmitt, Fairview Heights, both of Ill., assignors to Lukens General Industries, Inc., Coatesville, Pa.

Filed Jun. 11, 1984, Ser. No. 619,354
Int. Cl.³ B60L 5/39; B61F 5/00
U.S. Cl. 105—182 E **6 Claims**



1. In a railway vehicle truck, a pair of wheel and axle assemblies, journal boxes rotatably receiving the ends of the respective axles, resilient means carried by said journal boxes, longitudinally extending truck frame side members supported on said resilient means for vertical movement with respect to said journal boxes, each said truck frame side member having a vertical longitudinally extending wall, structure for supporting third rail collection gear and the like from the truck at a fixed height above the rails comprising a longitudinally extending beam supported from both journal boxes at each side of the truck and extending parallel to and transversely inwardly of said side member wall substantially mediate the top and bottom thereof, a mounting element positioned transversely outwardly of said truck frame side member wall, aperture means in said wall adjacent said mounting element, means passing through said aperture means and rigidly securing said mounting element to said beam, and opposing vertical surface portions on the outer surface of said wall and the inner surface of said mounting element spaced apart longitudinally and vertically and in vertical sliding relation with each other for maintaining said mounting element in vertical parallelism with said wall while accommodating vertical movements of said beam relative to said truck frame side member corresponding to vertical deflections in the resilient means supporting said frame side member on said journal boxes, said mounting element also having outwardly extending means for supporting third rail collection gear and the like.

4,526,109

LATERALLY DAMPED RAILWAY CAR

William W. Dickhart, III, Fort Washington, Pa., assignor to The Budd Company, Troy, Mich.

Filed Sep. 6, 1983, Ser. No. 529,443
Int. Cl.³ B61F 3/08, 5/10, 5/24
U.S. Cl. 105—199 R **3 Claims**

1. In combination with a railway truck and attached car body, damping apparatus connected between said truck and car body to provide lateral damping therebetween comprising:

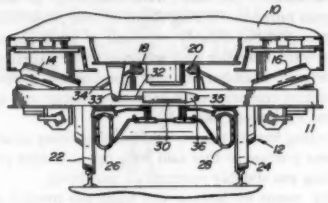
a. an elongated laterally disposed cylinder having fluid therein;

b. a piston having an opening disposed within said cylinder to provide two fluid chambers therein;

c. a piston rod extending through one end of said cylinder;

d. attachment members for connecting on end of said piston rod to the piston and the respective opposite ends of said cylinder and piston rod laterally between said truck and said car body, and

e. actuating means including blocker elements disposed on opposite sides of said opening responsive to lateral forces between said truck and car body to partially block and



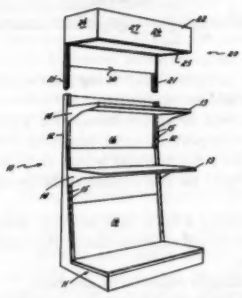
change the size of said opening in said piston to provide variable damping rates inverse to the magnitudes of said lateral force.

4,526,110

CANOPY FOR AN UPRIGHT DISPLAY

Leo J. Franz, Lilburn, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Oct. 6, 1982, Ser. No. 432,980
Int. Cl.³ A47B 47/00
U.S. Cl. 108—108 **1 Claim**



1. A canopy for use in combination with a merchandise display having a base, two elongated spaced vertical display uprights extending upwardly from said base and defining an open space therebetween, and at least one generally horizontal shelf carried by the vertical uprights and spaced upwardly from the base,

said canopy comprising a generally rectangular sheet metal front panel having a forward face, a rearward face and a pair of side edges, an upper flange bent from said front panel at an angle of about 90° thereto and extending rearwardly along substantially the entire length of said front panel, and a lower flange bent from said front panel at an angle of about 90° thereto and extending rearwardly along substantially the entire length of said front panel,

two generally rectangular sheet metal side panels each having a forward face, a rearward face, and first and second side edges, an upper flange bent from each of said side panels at an angle of about 90° thereto and extending rearwardly along substantially the entire length of each of said side panels, and a lower flange bent from each of said side panels at an angle of about 90° thereto and extending rearwardly along each said side panel from adjacent said first side edge thereof,

said upper and lower flanges of said side panels adjacent said first side edge of each side panel being juxtapositioned with the upper and lower flanges respectively of said front panel,

rivet means permanently pivotally joining said juxtapositioned

flanges of said side and front panels such that said side panels can be pivotally folded toward the front panel for storage or transport, and away from said front panel when in use,

means adapted to join said side panels to said canopy uprights along said second side edges of said side panels, and

a rectangular light diffuser mounted atop and at least partially supported from said upper flanges of said side panels.

4,526,111

NOZZLE FOR A FLUIDIZED BED FIRING SYSTEM

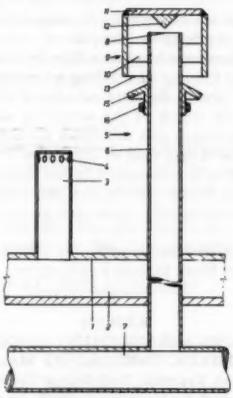
Walter Mischke, Herne, Fed. Rep. of Germany, assignor to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 236,787, Feb. 23, 1981, abandoned. This application May 23, 1983, Ser. No. 497,020

Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019701

Int. Cl.³ F23G *5/00;* **B05B** *1/26*

U.S. Cl. 110—245 **5 Claims**



1. Apparatus with a nozzle for a fluidized bed firing system, comprising in combination: hood means surrounding an end of a coal/air mixture transport pipe; a fluidized bed; said pipe extending into said fluidized bed; and axial exit opening between said hood means and said pipe; said pipe having said axial exit opening, said hood means being spaced from said exit opening; deflecting face means located in a vicinity opposite to said exit opening; and a baffle pointing downwardly, said baffle being attached to said pipe underneath a lower edge of said hood for radially deflecting the flow of the mixture of fuel and air exiting between the hood and said pipe, whereby the coal-/air mixture exits between said hood means and said pipe and impinges the baffle, said baffle deflecting the flow direction of said mixture so that the coal is distributed uniformly in the fluidized bed, fluidized material in the bed being prevented from entering feed lines between the baffle and lower edge of said hood means and between said pipe and hood means when air is maintained through the nozzle while coal feed is simultaneously stopped.

4,526,112

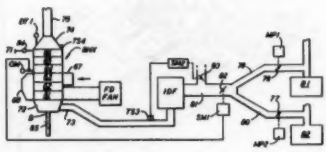
HEAT EXCHANGER METHOD AND APPARATUS

Donald F. Warner, Latham, N.Y., assignor to Heat Exchanger Industries, Inc., Latham, N.Y.

Division of Ser. No. 406,774, Aug. 10, 1982, Pat. No. 4,487,139, which is a continuation-in-part of Ser. No. 252,297, Apr. 9, 1981, abandoned, and Ser. No. 81,789, Oct. 4, 1979, abandoned. This application Nov. 14, 1984, Ser. No. 671,493

Int. Cl.³ F23J *11/00*

U.S. Cl. 110—345 **5 Claims**



1. The method of recovering heat energy from an exhaust gas by heating a fluid wherein said exhaust gas includes water vapor condensable at and below a water vapor condensation temperature and a corrosive constituent than said water vapor condensation temperature, said method comprising the steps of passing said exhaust gas successively through a first heat exchanger and a second heat exchanger, said second heat exchanger containing corrosion-protection material having a material limit operating temperature exceeding said corrosive condensation temperature, the flow rates and temperatures of said exhaust gas and said fluid being arranged so that passage of said exhaust gas through said first heat exchanger cools said exhaust gas from a first temperature to a second temperature which is below said material limit operating temperature but above said corrosive condensation temperature, passage of said exhaust gas through said second heat exchanger cools said exhaust gas from a temperature above said corrosive condensation temperature to a third temperature below said water vapor condensation temperature, and passage of said fluid through said second heat exchanger heats said fluid from a temperature below said water vapor condensation temperature to a fourth temperature which is above said corrosive condensation temperature but below said material limit operating temperature, whereby condensation of both water vapor and said corrosive constituent continuously occur within said second heat exchanger and neither water vapor nor said corrosive constituent condense within said first heat exchanger.

4,526,113

METHOD AND APPARATUS FOR MANUFACTURING PANTYHOSE

Werner Angele, Au am Rhein, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

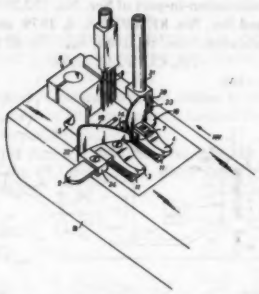
Division of Ser. No. 411,335, Aug. 25, 1982,. This application May 30, 1984, Ser. No. 615,390

Int. Cl.³ D05B *29/06, 35/02*

U.S. Cl. 112—127 **2 Claims**

1. A device for manufacturing pantyhose using hose shaped leg parts for a workpiece comprises a sewing machine having a presser foot with an opening therethrough through which the sewing machine needles may pass and having a sole with laterally spaced apart toe-shaped parts engageable into the respective leg portions, knife means carried by said presser foot adjacent the sewing machine needle opening for cutting

through the leg material along the edges thereof and deflecting means for deflecting the upper plies of the cut leg portions



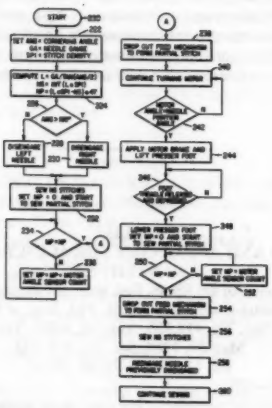
upwardly to overlap a remaining uncut portion of the leg portions during sewing.

4,526,114

METHOD AND APPARATUS FOR SEWING MITERED CORNERS ON A SPLIT NEEDLE BAR SEWING MACHINE

Charles R. Martell; Elmer N. Leslie, both of Dallas, and Stephen S. Tresdwell, Richardson, all of Tex., assignors to Microdynamics, Inc., Dallas, Tex.

Filed Feb. 25, 1983, Ser. No. 469,779
Int. Cl.³ D05B *19/00, 27/22, 1/08*
U.S. Cl. 112—262.1 **30 Claims**



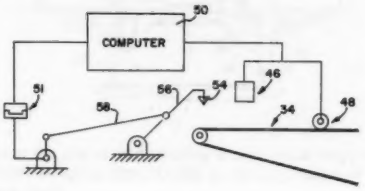
22. The method of claim **20** wherein the step of determining the position of the inside corner comprises counting the number of stitches between initiation of the sewing operation and the inside corner as defined by the parameters stored in the profile.

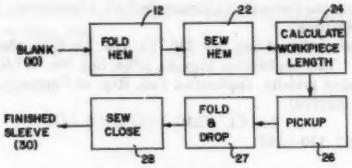
4,526,115

AUTOMATIC SLEEVE MAKING

Robert L. Kosrow, Hoffman Estates, and Chieh-Kung Yin, Hawthorn Woods, both of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Jun. 20, 1983, Ser. No. 505,671
Int. Cl.³ D05B *97/00, 21/00, 35/00, 27/00*
U.S. Cl. 112—262.3 **11 Claims**





1. A method for automatically forming a shirt sleeve from a sleeve blank comprising the steps of:

advancing the sleeve blank in a first direction;

automatically forming a hem along a first edge of said blank;

securing the hem in the marginal edge of the workpiece;

calculating the length of the advancing sleeve blank and developing length data as a result thereof;

processing the length data to allow a pick up and transfer means to fold the workpiece in half upon itself;

advancing the folded and hemmed sleeve blank in a second direction substantially transverse to said first direction; and

automatically securing together overlapped edges of the folded over blank to form a shirt sleeve.

4,526,116

METHOD AND ARRANGEMENT TO CONTROL AN AUTOMATIC EMBROIDERY MACHINE

Friedrich Männel, Kraichtal, Fed. Rep. of Germany, assignor to GVT Gesellschaft fur Verfahrenstechnik der garnverarbeitenden Industrie mbH, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 420,292
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138364
Int. Cl.³ D05C *5/06*
U.S. Cl. 112—266.1 **12 Claims**

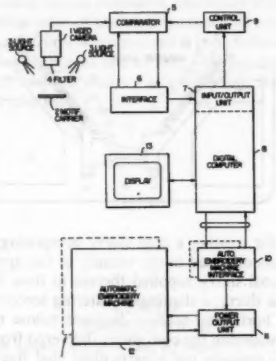
1. A method for controlling an automatic embroidery machine wherein individual scanning elements are copied from a displayed motif carrier and are transferred in the form of an embroidery program to a storage element, said embroidery program controlling at least one automatic embroidery machine by the coordinate displacement of its embroidery frame, comprising the steps of:

recording said motif as a line-scanned picture, which is converted to picture half-tones; wherein, in the case of color motifs, and line-scanned color-specific picture with scannable picture half-tones is recorded for each color of said color motif;

each picture is line-scanned;

each scanning element, which represents a picture half-tone

of an intensity between black and white is compared with an adjustable half-tone barrier and is accordingly classified as either lighter or darker than said barrier and thereby converted to a binary value corresponding thereto, said binary values being stored within a digital computer which stores conversion programs for embroidery techniques which are allocated to a plurality of



preselected geometric picture forms including lines and areas that are repeated in each embroidery pattern;

an embroidery program stored in the digital computer and corresponding to said displayed motif carrier is output to at least one automatic embroidery machine so as to control the operation thereof, said computer having stored said motif in a binary form in a section-by-section form from said geometric picture forms.

4,526,117

SEWING MACHINE MATERIAL GUIDING DEVICE

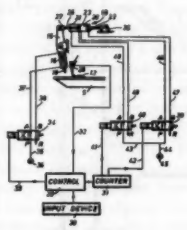
Erich Willenbacher, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,103

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314717

Int. Cl.³ D05B *27/08, 35/10*

U.S. Cl. 112—308 **11 Claims**



1. A sewing machine, comprising a reciprocating needle, material feeder means for feeding a material workpiece into association with the needle, a guide ruler for guiding the workpiece along the ruler edge in a material guiding device comprising a pressure pad engageable with the workpiece at a distance from said needle, first setting means connected to said pressure pad to raise and lower said pressure pad and second setting means connected to said pressure pad for shifting it toward and away from the needle.

4,526,118

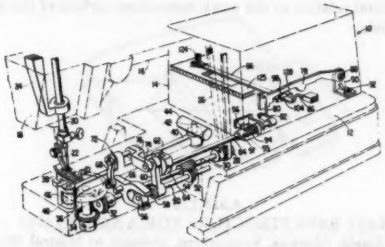
STITCH LENGTH CONTROL DAMPENING ARRANGEMENT FOR A SEWING MACHINE

Robert B. Brauch, Wayne, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 24, 1984, Ser. No. 653,166

Int. Cl.³ D05B *3/04, 27/00*

U.S. Cl. 112—315 **5 Claims**



1. In a sewing machine, feed regulating mechanism, a pivoted lever operably connected with the feed regulating mechanism, a stitch length control lever, a spring which biases said pivoted lever toward the stitch length control lever, the stitch length control lever including a low friction plunger with a camming surface which engages said pivoted lever and which in response to movement of the stitch length control member positions the pivoted lever to control operation of the feed regulating mechanism, said stitch length control lever also including a resilient shock absorber under the plunger to dampen vibrations of said pivoted lever occassioned by the operation of the feed regulating mechanism.

4,526,119

SEWING MACHINE HAVING A DRIVEN FEED ROLLER

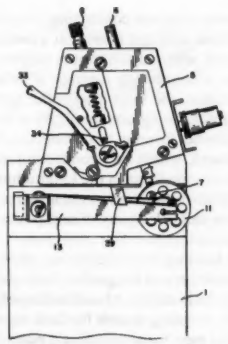
Wolf R. von Hagen, Hemmingen, Fed. Rep. of Germany, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,787

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1982, 3242937

Int. Cl.³ D05B *27/10*

U.S. Cl. 112—322 **11 Claims**



1. In a sewing machine having a work supporting surface, reciprocal needle means defining a stitch forming area, an upper feeding device comprising:

work feed means including a workpiece engaging feed wheel positively driven from a horizontally disposed shaft

arranged rearward of the stitch forming area in the direction of feed; and

supporting means for wholly arranging the feed wheel on one side of a plane bounded by the direction of feed, said support means includes pivotal means located rearward of the stitch forming area in the direction of feed, said pivotal means providing for pivotal movement of said feed wheel about two axes extending substantially vertical and horizontal relative to the work supporting surface of the machine.

4,526,120

MAST BASE STRUCTURE FOR A SAILBOARD

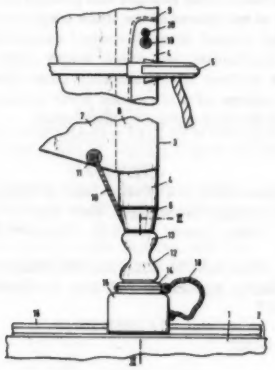
Albert Gaide, Monnaz, Switzerland, assignor to Mistral Windsurfing A.G., Nurensdorf, Switzerland

Filed Feb. 7, 1983, Ser. No. 464,398

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205841

Int. Cl.³ B63H 9/00

U.S. Cl. 114—39 **16 Claims**



1. A mast base structure connecting a rig, having a mast with a wishbone-boom attached thereto at a central section thereof, with a sailboard, wherein the mast is supported on a mast base upper section, a connecting member is located below a mast base lower section, the mast base upper section and the mast base lower section being connected by a universal joint, said connecting member forming the connection between said mast and said sailboard, which said connecting member is movable in a pinned down condition in the longitudinal direction of said sailboard parallel to the deck surface thereof to a plurality of positions and is lockable at any of said positions, said mast base structure comprising:

a track for holding said connecting member in said pinned down condition and for guiding it in said movement parallel to the deck surface of said sailboard;

a releasable coupling means for locking and releasing said connecting member at any of said positions with respect to said track, said releasable coupling means comprising a detent body biassed by means of a spring into a locking position for engaging portions said track, said releasable coupling means being remotely controllable by a manually operated control element located near said central section of said mast.

4,526,121

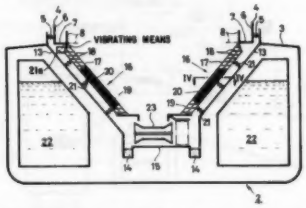
SHIP FOR TREATING COAL SLURRY

Yasunobu Shudo; Masayoshi Kano; Tatsuya Murahashi; Yasuo Nakai, and Kazuyoshi Hosogaya, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Aug. 30, 1982, Ser. No. 412,936

Int. Cl.³ B63B 25/04

U.S. Cl. 114—73 **12 Claims**



1. A ship for treating a coal slurry comprising coal slurry delivery means disposed in the vicinity of the upper deck for causing the coal slurry supplied thereto to flow forward and delivering the slurry, a slanting dewatering screen in the form of waves in horizontal section disposed below the delivery means for dewatering the coal slurry delivered from the delivery means to separate out a particulate coal fraction having relatively large particle sizes, and conveyor means for transporting to a specified position on the upper deck the particulate coal fraction dewatered and falling off the screen, and wherein the coal slurry delivery means is a tray having one end for admitting the coal slurry therethrough, the other end being closed, and an openable side plate.

4,526,122

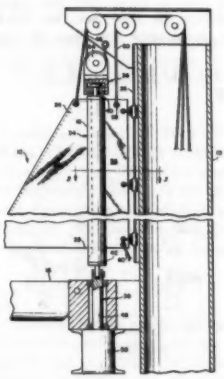
LOAD DISTRIBUTION AND ANTI-SAG MEANS FOR LUFF FURLING SAILS

Fred H. Kluckhuhn, 1618 Severn Dr., Annapolis, Md. 21401

Filed Mar. 8, 1984, Ser. No. 587,647

Int. Cl.³ B63H 9/10

U.S. Cl. 114—106 **10 Claims**



1. Anti-sag and load distribution means for minimizing the sag to leeward of a furling apparatus engaging the luff of a hoisted sail and for distributing the wind load on said sail uniformly along an adjacent rigging member, said furling apparatus having upper and lower pivoted connections at the head and tack of said sail and being substantially parallel to and freely spaced from an adjacent rigging member at least a distance sufficient to accomodate a furled sail wrapped around said furling apparatus, said connections defining the sole axis

about which said sail rotates relative to said rigging member as the sail moves between fore-and-aft and athwartship positions, said means comprising a strip of flexible material having a width substantially equal to the spacing between said apparatus and said adjacent rigging member, and a heighth substantially equal to the length of a luff of said sail, first fastening means extending uniformly along one longitudinal edge of said strip for slideable connection with said adjacent rigging member, second fastening means extending uniformly along the opposite longitudinal edge of said strip for slideable connection with said furling apparatus when said sail is in its unfurled condition, and means on the upper end of said strip for detachable connection with halyard means for controlling the raising and lowering of said strip.

4,526,123

ANCHOR RACK

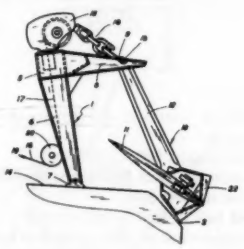
Rob van den Haak, Allegro 114, Krimpen A/D Ijssel, Netherlands

Filed Aug. 3, 1981, Ser. No. 289,440

Claims priority, application Netherlands, Aug. 6, 1980, 80 04476

Int. Cl.³ B63B *21/22*

U.S. Cl. 114—210 **4 Claims**



1. An anchor davit for pivotal mounting inboard on the deck of a ship to move an anchor attached to an anchor line by a shackle and a shackle pin, said anchor line running on sheaves on the anchor davit between positions racked on board and payed out, said anchor davit having a davit post mounted on a base for pivotal movement in a vertical plane, said davit post having a jib or outrigger arm mounted on said post for supporting the anchor in its racked position, said jib having a shackle pin engaging slot in an upper side thereof for engagement with said shackle pin, said davit post having a post head adapted to accommodate a sheave for guiding the anchor line, said davit post having a further sheave spaced from said post head to guide the anchor line from the sheave in said post head centrally through the davit post to a winch during an entire operation of said davit, said jib having lateral arms arranged to rest in a recess in the deck of a ship to transmit their load thereto, said shackle pin engaging slot intercepting the shackle pin in an outboard position of said anchor between said racked and payed out positions and carrying the anchor in its rack position and to and from its payed out position, whereby when the shackle pin is caught by said shackle pin engaging slot the shackle is arrested by the sheave block on the post head whereupon hauling of the anchor line by the winch will cause the anchor davit carrying the anchor to pivot up.

4,526,124

FENDER HOLDER

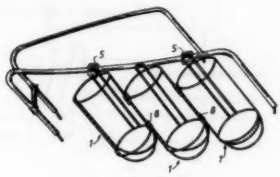
John Hartwall, Söderkulla, Finland, assignor to 501 KY K. Hartwall KB, Söderkulla, Finland

Filed Oct. 28, 1983, Ser. No. 546,497

Claims priority, application Finland, Nov. 10, 1982, 823855

Int. Cl.³ B63B *59/02*

U.S. Cl. 114—219 **5 Claims**



1. A fender holder unit comprising at least two parallel fender baskets coupled together and provided with a hanging member for fastening the unit to the boat railing, said hanging member being constructed to permit the adjustment of the unit into different angles relative to the railing, the basket comprising an open framework formed by elongated rod members combined with an upper and lower ring formed member, thus forming an open basket to receive the fender therein, said baskets being coupled together by means of locking members grasping the adjacent elongated rod members of the baskets, said rods gliding along each other, when adjusting the basket angle position, and said rods being adapted to be locked by said locking members when a desired position is obtained, thereby fixing the baskets in said desired position.

4,526,125

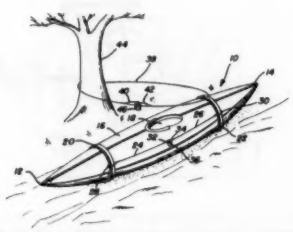
SECURITY LOCK FOR KAYAKS AND THE LIKE

John W. Bain, Jr., 112 Hedgewood Dr., Chattanooga, Tenn. 37405

Filed Nov. 7, 1983, Ser. No. 549,617

Int. Cl.³ A63C *15/00*

U.S. Cl. 114—347 **14 Claims**



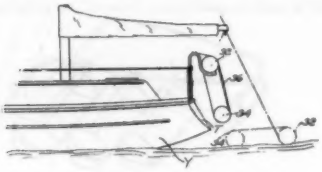
13. A method of securing an elongated mobile object to a stationary body, said object having a central portion narrowing toward spaced apart ends, said method comprising: inserting one end of said object through a first hoop and inserting the other end of said object through a second hoop, each hoop having a cross-sectional dimension larger than than that of the respective ends and smaller than the largest cross-sectional dimension of said central portion, selectively tying said hoops together by a first cable of a length shorter than the length of said object such that when tied neither hoop can be dislodged from the end inserted therein, and securing at least one of said hoops to said stationary object by looping a second cable about said stationary body and said hoop, and locking the ends of said second cable together.

4,526,126

RUBBER BOAT STERN SUPPORT DEVICE

Richard G. Dunn, 4605 Ramblewood Dr., Greensboro, N.C. 27406

Filed Dec. 15, 1983, Ser. No. 561,956
Int. Cl.³ B63B *23/62*
U.S. Cl. 114—365 3 Claims



1. An inflatable boat storage device for suspending the boat at the stern of a yacht,

said boat having a pair of spaced pontoons,

said yacht having a stern pulpit with horizontal and vertical members,

said device comprising a pair of posts each with an upper end curved downwardly and outwardly to form an upwardly opening hook,

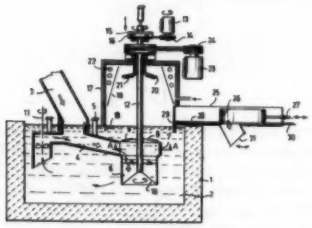
said posts being spaced apart and swivably affixed to one of said members intermediate the ends of the posts, the lower end of the posts resting on the yacht whereby the upward opening hooks engage one of the pontoons of the boat for supporting the boat in a general vertical position.

4,526,127

APPARATUS FOR COATING STEEL OBJECTS WITH AN ALLOY OF ZINC AND ALUMINIUM

Pertti J. Sippola, Espoo, Finland, assignor to Ra-Shipping Ltd. Oy, Espoo, Finland

Filed Nov. 29, 1983, Ser. No. 556,019
Int. Cl.³ B05C *3/02*
U.S. Cl. 118—54 11 Claims



1. Apparatus for coating steel objects with an alloy of zinc and aluminium, comprising,

a bath containing a molten alloy of zinc and about 5% of aluminium,

means for feeding steel objects, preheated to a temperature within the range 400° C.–950° C., into the bath,

a centrifuging chamber above the bath and containing an oxygen-free atmosphere,

a cage means movable between a first position within the bath, in which position the cage means is arranged to receive the steel objects fed into the bath, and a second position in the centrifuging chamber above the bath, in which second position the cage means is arranged to rotate in order to remove excess coating material from the steel objects, a conveyor pipe being arranged within the bath for receiving the steel objects, said conveyor pipe being downwardly inclined and leading to the cage means, a pump being arranged in the conveyor pipe to produce a flow of molten metal for conveying the steel objects, and means for removing the steel objects from the cage means to the outside of the centrifuging chamber, after the centrifugation.

4,526,128

HIGH-SPEED INDEXING FEED SCREW CONVEYER

Joseph Sorace, Huntington Valley, Pa., and George Wright, Center Barnstead, N.H., assignors to Advanced Tech Tool, Ltd., Huntingdon Valley, Pa.

Filed Feb. 13, 1984, Ser. No. 579,434
Int. Cl.³ B05B *7/06;* B05C *5/00*
U.S. Cl. 118—314 9 Claims

1. A cylindrical container conveyance and indexing machine, comprising;

(a) a vertical support bed,

(b) a first vertical helical feed screw rotatably mounted on the vertical support bed,

(c) a second helical feed screw rotatably mounted on the vertical support bed parallel to the first helical feed screw with threads cut thereon symmetrical to the thread of the first feed screw, and positioned proximate to the first feed screw so that conveyance troughs are formed between opposite facing radial sidewalls of both screws, said conveyance troughs being shaped such that when cylindrical objects occupy the troughs they contact both radial sidewalls along two lines across the surface of the cylindrical object, said feed screws having at least one area along their length where the sidewalls extend partway around the screws in radial planes of the screws to stop temporarily the movement of the cylindrical object, and

(d) drive means which rotate and synchronize the feed screws in a 1:1 counter-rotating relationship.

4,526,129

MEANS FOR PROCESSING MINIATURE ELECTRONIC COMPONENTS SUCH AS CAPACITORS OR RESISTORS

Denver Braden, Carlsbad, Calif., assignor to Palomar Systems & Machines, Inc., Escondido, Calif.

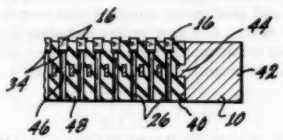
Continuation-in-part of Ser. No. 123,201, Feb. 21, 1980, Pat. No. 4,315,184. This application Oct. 22, 1981, Ser. No. 313,785
The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.
Int. Cl.³ B05C *13/02*
U.S. Cl. 118—503 5 Claims

1. A plate to support a multiplicity of miniature electronic

parts such as capacitors, resistors or the like, used in coating ends of the parts, comprising:

(a) a substantially rigid plate-like body having a multiplicity of juxtaposed parallel bores therethrough, and

(b) resilient material coating said bores and defining passageways having resilient walls of substantially uniform cross section from end to end of said passageways and substantially from face to face of said body, each passageway having at least one cross-sectional dimension shorter than the corresponding cross-sectional dimension of each part and said resilient walls of said passageways being capable of continuously resiliently gripping such parts in all positions in said passageways whether protruding from either end of said passageways or whether completely contained within said passageways.



4,526,130

DEVELOPING APPARATUS

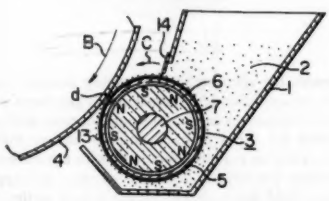
Kozi Fukuda, and Keitaro Yamashita, both of Saitama, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jan. 26, 1983, Ser. No. 461,195

Claims priority, application Japan, Feb. 3, 1982, 57-15907

Int. Cl.³ G03G *15/09*

U.S. Cl. 118—657 **4 Claims**



1. A developing apparatus comprising an image support having a latent image formed on the surface, a cylindrical sleeve made of an aluminum alloy placed so as to face the image support, and a magnetic field-generating means placed in said sleeve, said image support and said sleeve being arranged so that a magnetic developer held on said sleeve can be conveyed to the surface of the aforesaid image support, thereby developing the aforesaid latent image, characterized in that on the surface of the aforesaid sleeve is formed a Ni-P alloy coating layer having a thickness of at least 1 μm, a hardness of at least HV900 and a specific resistance of 10^6 Ω-cm or less.

4,526,131

MAGNETIC RECORDING MEDIUM MANUFACTURING APPARATUS

Ryuji Shirahata; Masaru Sekine, and Goro Akashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 8, 1984, Ser. No. 587,420

Claims priority, application Japan, Mar. 8, 1983, 58-37907

Int. Cl.³ C23C *13/10*

U.S. Cl. 118—718 **7 Claims**

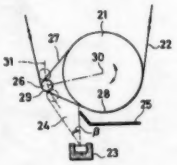
1. A magnetic recording medium manufacturing apparatus for depositing a material onto a tape-shaped support, said apparatus comprising:

a first roller having a central axis;

a second roller adjacent said first roller and swingable about the central axis of said first roller;

transporting means for transporting said support between said first and second rollers;

an evaporation source for evaporating said material for deposit onto said support; and



wherein said second roller is swingable to a plurality of positions including a first position where the closest point on the cylindrical wall of said second roller to said evaporation source is closer to said evaporation source than the closest point on the cylindrical wall of said first roller, and a second position where the closest point on the cylinder wall of said second roller to said evaporation source is further from said evaporation source than the closest point on the cylindrical wall of said first roller.

4,526,132

EVAPORATOR

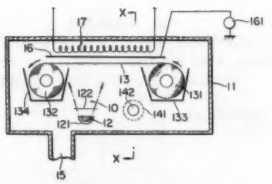
Tatsuo Ohta, Sagamihara, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Japan

Filed Nov. 22, 1983, Ser. No. 554,242

Claims priority, application Japan, Nov. 24, 1982, 57-205886; Dec. 29, 1982, 57-230998

Int. Cl.³ C23C *13/12*

U.S. Cl. 118—719 **24 Claims**



1. An evaporator for performing deposition on a substrate in a vacuum into which a reactive gas is introduced, the evaporator comprising:

a vacuum tight containment means having an outwardly protruding portion;

a vapor source disposed inside said containment means;

an evaporation space between the substrate and said vapor source;

a discharger disposed inside said outwardly protruding portion of said containment means and thereby isolated from said evaporation space, said discharger being directed away from the substrate and away from said evaporation space, said discharger comprising a gas introduction tube and a discharge electrode surrounding said gas introduction tube; and

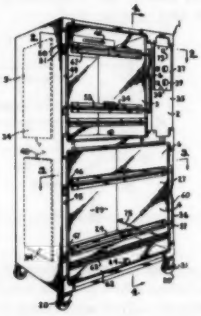
a protective member covering said gas introduction tube and said discharge electrode.

4,526,133

ANIMAL ISOLATION CAGE WARD

F. Leo LoMaglio, Kansas City, Mo., assignor to Schroer Manufacturing Co., Inc., Kansas City, Mo.

Filed Mar. 5, 1984, Ser. No. 586,191
Int. Cl.[3] A01K *1/03*
U.S. Cl. 119—17 9 Claims



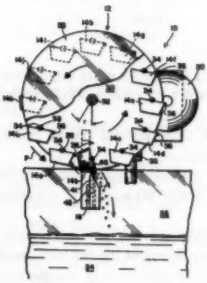
1. An animal isolation cage ward comprising:
(a) a housing having an open front;
(b) a confinement unit mounted in said housing and having enclosing walls and an open front coinciding with said housing open front;
(c) a door of substantially impervious material mounted over and substantially filling said unit open front and being slightly smaller than said unit open front and having a narrow gap around a periphery of said door for airflow into said unit;
(d) an exhaust port in said unit;
(e) a plenum within said housing communicating with said exhaust port;
(f) an exhaust blower mounted in said housing for drawing air through said plenum, said exhaust port, said unit and around said door from atmosphere exterior of said housing; and
(g) a duct connection to said exhaust blower for routing contaminated air outwardly.

4,526,134

AUTOMATIC FISH FEEDING APPARATUS

Charles Sapp, 2149 Rio Guacimal Ct., San Jose, Calif. 95116

Filed Feb. 27, 1984, Ser. No. 583,605
Int. Cl.[3] A01K *5/02*
U.S. Cl. 119—51.13 14 Claims



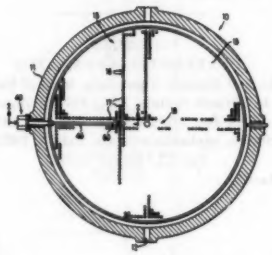
1. An automatic fish feeding apparatus comprising:
a wheel means having a substantially horizontal axis of rotation;
a plurality of feed buckets pivotally attached to and evenly spaced around a circumferential portion of said wheel means, where adjacent pairs of said feed buckets are separated by a fixed, predetermined radial angle;
a trip member located in the path of said feed buckets; and
clock means coupled to said wheel means and operative to rotate said wheel means by said predetermined radial angle, whereby one of said feed buckets engages and is tipped over by said trip member, said clock means including a continuous operation motor having a rotary output shaft, and gear means coupling said output shaft to said wheel means, said gear means including a clocking gear coupled to said motor means, and a wheel gear attached to said wheel means.

4,526,135

EDDY CURRENT WORKPIECE POSITIONING APPARATUS

Gregory L. Calhoun, Allegheny Township, Allegheny County, and Clark B. Candee, Edgewood, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 576,678, Feb. 3, 1984, abandoned. This application Nov. 13, 1984, Ser. No. 671,012
Int. Cl.[3] F22B *37/54*; F28F *15/00*; F28G *9/00*
U.S. Cl. 122—382 18 Claims



1. Apparatus for accurately determining position with respect to the vertical tubes of a nuclear steam generator wherein the tubes are disposed in an array of parallel rows and parallel columns, with the tubes in each column having their axes aligned in a common column plane and with a predetermined spacing between the tubes of adjacent columns, said apparatus comprising: a fluid lance nozzle having a fluid outlet orifice, transport means for moving said nozzle past the columns of tubes closely adjcent thereto in directions perpendicular to the column planes thereof, said orifice being disposed for discharging a stream of fluid parallel to the column planes, and eddy-current sensing means carried by said nozzle and having a sensing axis disposed parallel to the column planes, said sensing means being responsive to disposition of said sensing axis in a lancing position coplanar with one of the column planes for generating a predetermined output signal level, said orifice being disposed so that the fluid stream therefrom will pass between adjacent columns when said sensing axis is disposed in the lancing position thereof.

4,526,136

CONTROL SYSTEM FOR FLUID HEATED STEAM GENERATOR

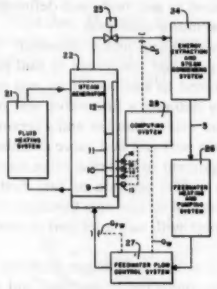
James F. Boland, Bonneville County, and John F. Koenig, Idaho Falls, both of Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 29, 1984, Ser. No. 614,507
Int. Cl.[3] F22D *5/26*
U.S. Cl. 122—451.1 10 Claims

1. A system for controlling the location of the nucleate boiling region in a fluid heated steam generator comprising:

means for measuring the temperature gradient of the heating fluid at a plurality of locations along the steam generator;

means for determining a control variable, Q_w, in accordance with a predetermined relationship, said relationship being



a function of said measured temperature gradients, and for generating a control signal in response thereto; and

means for adjusting the feedwater flow rate into the steam generator, in accordance with said control signal.

4,526,137

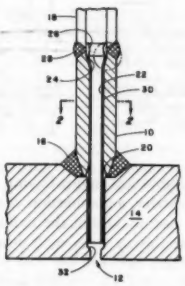
THERMAL SLEEVE FOR SUPERHEATER NOZZLE TO HEADER CONNECTION

Frank E. Garrison, Clinton, and George H. Harth, III, Uniontown, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 5, 1984, Ser. No. 586,528

Int. Cl.³ F22G *7/14*

U.S. Cl. 122—476 **20 Claims**



1. In a superheater including a header which has a flow passage through a wall thereof and a nozzle which is weldably connected to the header, the nozzle having a bore extending therethrough from a first end to a second end and in fluid communication with the header flow passage at the first end and with a superheater tube at the second end, the improvement comprising a sleeve which extends through at least part of the length of the bore of the nozzle and further extends at least part of the distance through the header flow passage.

4,526,138

FLUID INJECTOR FOR INTERNAL COMBUSTION ENGINE

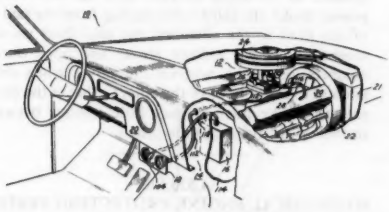
Ronald H. Cooper, 21340 Willowview, Bristol, Ind. 46507

Filed May 2, 1980, Ser. No. 146,043

Int. Cl.³ F02D *19/00*

U.S. Cl. 123—25 E **15 Claims**

1. A fluid injector for supplying a fluid-air mixture to an internal combustion engine having a vacuum line thereon, said fluid injector comprising a body having a chamber for mixing fluid and air to be supplied to said engine, an air inlet port in said chamber for admitting ambient air to said chamber, a fluid inlet port in said chamber for admitting fluid into said chamber for mixing with the air entering said chamber through said air inlet port, a fluid reservoir for holding fluid to be supplied to said chamber, fluid flow means for placing said fluid inlet poit and said fluid reservoir in flow communication, an outlet port in said chamber through which the fluid-air mixture passes to flow to the engine, a second fluid flow means for placing said outlet port and the vacuum line of the engine in flow communi-



cation, adjustable valve means having a stem with a threaded portion holding the valve means in various fixed, adjusted positions irrespective of the vacuum transmitted to said chamber through said second fluid flow means, for regulating the volume of fluid entering said chamber, and pressure responsive shut off means in said inlet port for stopping the flow of fluid from said reservoir to said chamber through said first fluid flow means, said shut off means including a valve in said fluid inlet port, having an inwardly extending flange in said port, a ball for seating on said flange to close said port, and a spring for biasing said ball against said flange yieldable to vacuum in said chamber.

4,526,139

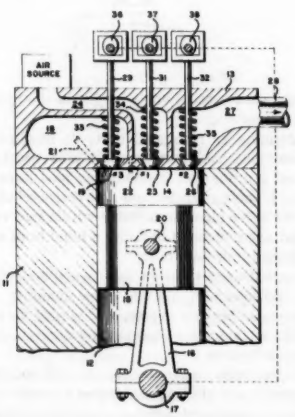
INTERNAL COMBUSTION ENGINE

Edward I. Medlinsky, 3 Kelley Sq., Worcester, Mass. 01610

Filed Sep. 9, 1983, Ser. No. 530,708

Int. Cl.³ F02B *41/00*

U.S. Cl. 123—26 **1 Claim**



1. Internal combustion engine of the 4-cycle type, comprising:

(a) a block having a cylinder bore,

(b) a head mounted on the block and having a surface which

closes one end of the bore, an inlet valve and an exhaust valve being mounted in the head, the inlet valve leading from the said surface of the head through a passage to a source of combustion air, and the exhaust valve leading from the surface of the head through a passage to exhaust,

(c) a piston slidable in the bore to a position close to the head, so that very little product of combustion remains at the end of the exhaust stroke,

(d) a chamber formed in the head and having access to the upper end of the bore, and

(e) a third valve admitting compressed air into the chamber during the compression stroke and releasing the compressed air from the chamber into the bore during the power stroke, the third valve leading from the said surface of the head to the chamber, the said third valve being closed during the exhaust stroke and open during the compression stroke, wherein the valves when closed do not add to the volume of the bore, so that at the end of the exhaust stroke there is very little volume between the surface of the head and the piston.

4,526,140

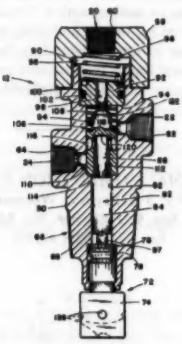
MECHANICAL ENGINE PROTECTION SYSTEM

Larry E. Monigold, and Ordale Lewis, both of Cadillac, Mich., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Division of Ser. No. 376,688, May 10, 1982, Pat. No. 4,483,287. This application Sep. 4, 1984, Ser. No. 647,148

Int. Cl.³ F02B *77/08*

U.S. Cl. 123—41.15 **16 Claims**



1. A temperature sensing valve for use in an engine protecting system, comprising:

a body defining an elongated bore, an inlet port in axial alignment with said bore, an outlet port opening into said bore and a drain port opening into said bore, said bore defining a valve chamber and an overtravel chamber;

a spool-like valve element movable within said valve chamber, said valve element defining a blind bore and a spool port opening into said bore;

a valve seat disposed within said overtravel chamber between said inlet port and said valve chamber;

spring means within said overtravel chamber for biasing said seat towards said valve chamber and against a stop defined by said body; and

thermally responsive means secured to said body for sensing temperature and shifting said valve element from a first position at which said outlet port communicates with said inlet port through said valve seat and a second position at which said valve element engages said valve seat and said outlet port communicates with said drain port through said blind bore and said spool port.

8. A pressure sensing valve for sensing engine oil pressure and causing actuation of an engine shutdown device, said valve comprising:

a body defining a motor chamber, a valve chamber, a bore connecting said chambers, an inlet port, an outlet port and a drain port, said ports opening into said valve chamber;

an end member joined to said body and defining a pilot port opening into said motor chamber;

a piston disposed within said motor chamber;

a piston rod having an end connected to said piston;

a valve member joined to said rod at an end opposite said piston, said body defining a first valve seat between said inlet port and said valve chamber and a second valve seat between said drain port and said valve chamber, said seats being in axial alignment so that said valve member may be moved between a first position at said first seat and a second position at said second seat to selectively interconnect said outlet port with said inlet port or said drain port; and

a rolling diaphragm within said motor chamber and having a central portion connected to said rod and a peripheral bead, said bead being retained between said end member and a shoulder defined by said body.

4,526,141

DRIVE ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

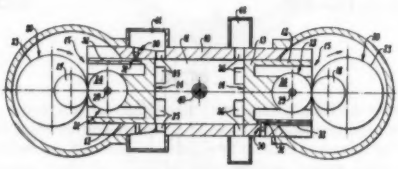
Brian G. Catchpole, Burwood, Australia, assignor to The Commonwealth of Australia, Australian Capital Territory, Australia

Filed Feb. 13, 1984, Ser. No. 579,548

Claims priority, application Australia, Feb. 15, 1983, PF8041

Int. Cl.³ F02B *25/08*

U.S. Cl. 123—51 BA **15 Claims**



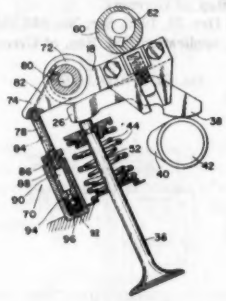
1. An internal combustion engine having an operating cycle and including: a cylinder, a combustion chamber in the cylinder, two opposed pistons within the cylinder and relatively movable towards and away from each other, the combustion chamber being defined between the two pistons, each piston having an inner side defining a movable wall of the combustion chamber and also having an outer side, two rotary output shafts extending generally transverse to the axial direction of movement of the pistons, characterised in that said pistons are freely independently movable within the cylinder, an eccentric portion being provided on each output shaft so as to be rotatable therewith which comprises a cam face which is eccentrically located relative to the rotational axis of the respective output shaft, each piston having an eccentric follower portion on the outer side thereof which comprises a rotary member which is rotatably mounted on the outer side of each piston so as to provide a rolling contact between the eccentric follower portion and the eccentric portion, each eccentric follower portion being arranged to bear against the associated eccentric portion of the respective output shaft solely under inertial forces and gas forces that are outwardly directed and arise within the combustion chamber with the eccentric portion being unconstrained by said eccentric follower portion so as to transmit outwardly directed gas forces arising within the combustion chamber and acting on the piston inner sides to the eccentric portions so as to drive the output shafts.

4,526,142

VARIABLE VALVE TIMING ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE OR THE LIKE

Seinosuke Hara; Shunichi Aoyama, and Kazuyuki Miisho, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jun. 28, 1982, Ser. No. 393,082
Claims priority, application Japan, Jun. 30, 1981, 56-98130[U]; Jun. 30, 1981, 56-98131[U]
Int. Cl.³ F01L *1/24*
U.S. Cl. 123—90.16 **17 Claims**



1. In a valve train for inducing reciprocative motion in a valve:

a lever pivotally mounted at one end on a stationary shaft;

a rocker arm engaging said lever to define a fulcrum point therebetween, said rocker arm engaging said valve at one end thereof;

first means, engaging one of a pair of elements comprising the other end of said rocker arm and said lever, for periodically causing the engaged element to pivot from a home position in a manner such that said fulcrum point moves away from the axis of rotation about which said lever pivots;

second means, engaging the other of said pair of elements comprising the other end of said rocker arm and said lever, for selectively controlling the angular position thereof with respect to said valve; and

third means comprising biasing means mounted on said lever for maintaining a zero clearance between said rocker arm and said valve.

4,526,143

DIRECT INJECTION INTERNAL COMBUSTION ENGINE OF COMPRESSION IGNITION TYPE

Yujiro Oshima, and Taro Aoyama, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Aug. 26, 1983, Ser. No. 526,841
Claims priority, application Japan, Aug. 27, 1982, 57-149620
Int. Cl.³ F02B *31/00*
U.S. Cl. 123—301 **14 Claims**

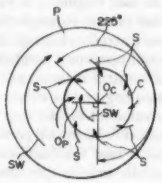
1. A direct injection internal combustion engine of a compression ignition type, in which a fuel is injected into air supplied into a combustion chamber and compressed by a piston so that the fuel may be ignited and burned, comprising:

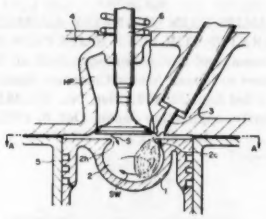
intake means including means for supplying the swirling intake air into said combustion chamber;

said combustion chamber comprising a substantially semi-spherical cavity formed in the top surface of said piston, the center of said cavity being offset with respect to the central axis of said piston top surface by an eccentricity Os as satisfies the following relationship, where D is the diameter of said piston,

$$0.02 < Os/D < 0.15;$$

and fuel injection nozzle means for injecting a fuel spray





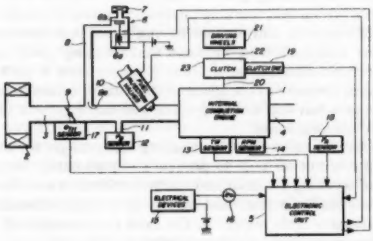
having a large tangential velocity component with respect to the axis of an injection portion and an axial velocity along the forward direction of the swirling flow of intake air formed in said cavity.

4,526,144

IDLING RPM FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Shumpei Hasegawa, Niiza, and Yuzi Makino, Mitaka, both of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,111
Claims priority, application Japan, Mar. 11, 1983, 58-40280
Int. Cl.³ F02M *3/00*
U.S. Cl. 123—339 **6 Claims**



1. A method of controlling a control valve for regulating the quantity of supplementary air being supplied to an internal combustion engine, in a feedback manner responsive to the difference between actual engine rpm and desired idling rpm, said engine having an intake passage, a throttle valve arranged in said intake passage, and an air passage having one end communicating with said intake passage at a location downstream of said throttle valve and another end communicating with the atmosphere, respectively, said supplementary air being supplied to said engine through said air pressure and said intake passage, said method comprising the steps of:

(a) detecting a value of atmospheric pressure encompassing said engine;

(b) determining whether or not said engine is in a predetermined operating condition while said engine is decelerating immediately before entering a region where said feedback control is to be executed;

(c) setting the volumetric flow rate of said supplementary air to be supplied to said engine to a value dependent upon the detected value of said atmospheric pressure when it is determined at said step (b) that said engine is operating in said predetermined operating condition; and

(d) controlling said control valve so as to supply said supplementary air to said engine at a volumetric flow rate corresponding to the value set at said step (c), after said engine has been determined to be in said predetermined operating condition and until said feedback control is initiated, to thereby stabilize the engine rpm immediately after said feedback control has been initiated.

4,526,145

FUEL INJECTION QUANTITY ADJUSTMENT APPARATUS FOR FUEL INJECTION PUMP

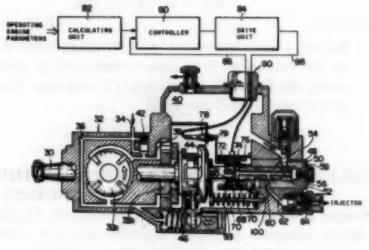
Masahiro Honma, and Iwane Inokuchi, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 30, 1982, Ser. No. 432,382

Claims priority, application Japan, Oct. 6, 1981, 56-158138

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—357 **21 Claims**



1. A fuel injection quantity adjustment apparatus for a fuel injection pump in an internal combustion engine, comprising:

(a) a fuel injection plunger reciprocating axially within a fuel injection working space or chamber so as to force out fuel from within said working chamber to one of a plurality of fuel injectors, said plunger having a fuel injection cut-off port communicating between said working space and a reservoir chamber at a lower pressure than a predetermined pressure in the space so that fuel injection does not occur when said working space and said reservoir chamber communicate;

(b) a cut-off valve slidably engaging said plunger for blocking said cut-off port to prevent communication between said working chamber and reservoir chamber and thereby allow fuel injection, said cutoff-valve being substantially stationary with respect to the axial reciprocation of said plunger and having a magnetized portion;

(c) electromagnetic means for selectively producing magnetic fields of selectable polarity aligned along the axis of said plunger to displace said cut-off valve with respect to said plunger wherein said electromagnetic means comprises a pair of solenoids coaxial with, axially opposing, and radially separated from said cut-off valve, said solenoids being aligned end-to-end and wound so as to produce coaxial magnetic fields of opposite polarity;

(d) an electromagnetic sensor for detecting the position of said cut-off valve and outputting a signal indicative thereof; and

(e) a controller responsive to said sensor signal and to engine operating conditions for calculating a desired position of said cut-off valve in accordance with a desired fuel injection quantity, said controller comparing said sensor signal to said desired position and energizing said electromagnetic means to displace said cut-off valve toward the desired position as indicated by the difference between the desired position and the actual valve position indicated by said sensor signal.

4,526,146

FUEL INJECTION PUMP

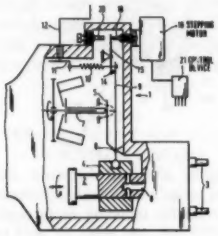
Ilija Djordjevic, Windsor, Conn., and Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 21, 1983, Ser. No. 544,186

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243349

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—357 **11 Claims**



1. A fuel injection pump including a housing, a lever pivotable about a fixed axis in said housing, a stop on one end of said lever which limits the movement of a quantity adjusting device actuatable counter to a spring force, a stepping motor for actuating said lever, said stepping motor is embodied as a linear stepping motor, with which at least one end stop is associated, and includes a lever adjusting device which pivots said lever about said fixed axis for adjusting the movement of said quantity adjusting device, said stepping motor includes a magnetic coil and an armature which is acted upon by a first restoring spring supported in a stationary manner and which armature is adjustable counter to the force of said first restoring spring in accordance with at least one defined adjusting path and further adjustable counter to the force of at least one pre-stressed additional restoring spring in accordance with another defined adjusting path subsequent to said at least one defined adjusting path.

4,526,147

APPARATUS FOR CONTROLLING THE AIR-FUEL RATIO OF AN INTERNAL COMBUSTION ENGINE

Ferdinand Grob, Besigheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,546

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 3311350

Int. Cl.³ F02B *3/08*

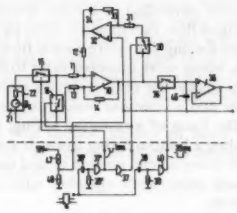
U.S. Cl. 123—440 **22 Claims**

1. Apparatus for controlling the air-fuel ratio of an internal combustion engine comprising:

a lambda probe responsive to changes in said ratio and monitoring said ratio over a range of lambda values that includes a region wherein the output voltages of the probe exhibit only a weak dependence upon inputs to the probe; and,

a circuit arrangement for evaluating the output of said probe and including: an operational amplifier wherein an offset voltage occurs because of drift in said circuit arrangement and temperature variations to which said probe is subjected during operation thereof; and, compensation means

for compensating for said offset voltage thereby permitting a precise regulation of the air-fuel ratio in said region, said compensation means including circuit means for compensating for said offset voltage of said operational amplifier, said circuit means including switching means



for switching said operational amplifier from the operation mode into and out of a compensation mode in a sequence corresponding to segments of time when it is not necessary or possible to conduct a determination of the lambda value.

4,526,148

AIR-FUEL RATIO CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

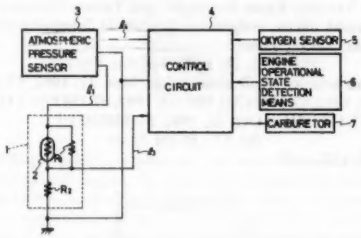
Shin Narasaka, Yono; Kazuo Otsuka, Higashi-Kurume, and Eiji Kishida, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1983, Ser. No. 471,269

Claims priority, application Japan, Mar. 31, 1982, 57-053161

Int. Cl.³ F02M 7/12

U.S. Cl. 123—440 **3 Claims**



1. A closed-loop air-fuel ratio control system for an internal combustion engine having an exhaust system comprising:

an oxygen sensor disposed in said exhaust system;

an air pressure sensor means for sensing an atmospheric pressure and for producing a pressure signal having a voltage level responsive to said atmospheric pressure;

an intake air temperature sensor means for sensing the temperature of the intake air of said engine and for producing a temperature signal having a voltage level responsive to said temperature of intake air, said air pressure sensor means being connected to said intake air temperature sensor means so that said pressure signal is applied to said temperature sensor means as an input voltage and that said temperature signal from said temperature sensor means becomes a combined sensor signal whose level has a component of the level of said pressure signal;

a control circuit means for producing a fuel supply control signal, an output signal of said oxygen sensor and said combined sensor signal responsive to the atmospheric pressure and the temperature of the intake air are respectively supplied as an input signal to said control circuit means, said control circuit means having a closed-loop mode of operation in which said fuel supply control signal is calculated on the basis of an output signal of said oxygen sensor and an open-loop mode of operation in which said fuel supply control signal is fixed to a predetermined value which is determined in accordance with said combined sensor signal upon occurrence of predetermined operational states of the engine; and

a fuel supply control means coupled to said control circuit means, for controlling the fuel supply in response to said fuel supply control signal.

4,526,149

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

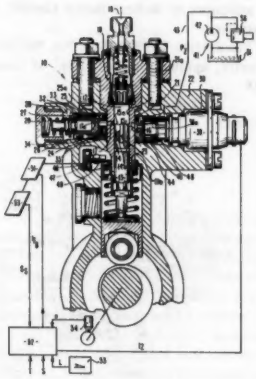
Walter Häfele, Fellbach, Fed. Rep. of Germany; Helmut Pfeifle, Ecally, France; Reinhard Schwartz, and Max Straubel, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,042

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307826

Int. Cl.³ F02M 39/00

U.S. Cl. 123—447 **16 Claims**



1. A fuel injection apparatus for internal combustion engines, having at least one pump piston guided in an axially and rotationally movable manner in a pump cylinder of a fuel injection pump and defining a pump work chamber between said pump piston and a supply valve, the pump piston being provided with first and second control locations axially offset from one another along said piston, said first control location embodied as an oblique control edge and in order to terminate an effective supply stroke opens an overflow opening disposed separately from an inflow opening in the pump cylinder and upon a return stroke of the pump piston enables a refilling of a return-flow fuel quantity diverted from said chamber following the end of supply;

a fuel reservoir connectable with the pump work chamber via said overflow opening and an overflow conduit;

an adjusting device that serves to shift the instant of supply onset by means of rotating the pump piston and is provided with an electromechanical adjusting member;

an electromechanically actuatable metering valve for supplying the pump work chamber via the inflow opening with fuel pumped from a source of low pressure, said metering valve, with its opening duration, determining a fuel injection quantity pre-stored in the pump work chamber;

an electric control unit, which emits control pulses (I_{FB}, I_Z) dependent on operating characteristics (n, T, S_S, S) both to the piston adjusting member and to the metering valve;

said fuel reservoir embodied as a refill reservoir, said refill

reservoir includes a reservoir chamber and a reservoir piston, said reservoir piston including a bottom facing towards said pump work chamber and filling an end portion of said reservoir chamber facing said pump work chamber when in its nondisplaced position and being displaceable counter to a force of a restoring means in which said reservoir chamber receives an entire return-flow fuel quantity diverted after the end of supply and returning this quantity back into the pump work chamber prior to the next subsequent supply stroke, said overflow condiit representing the sole and direct connection between the refill reservoir and the pump work chamber, and that said overflow opening is located at the discharge location of the overflow conduit into the pump work chamber and is openable by said first and second control locations of the pump piston.

4,526,150

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

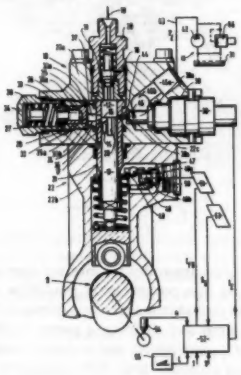
Josef Güntert, Gerlingen; Walter Häfele, Fellbach, both of Fed. Rep. of Germany; Helmut Pfeifle, Ecally, France; Reinhard Schwartz, and Max Straubel, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,057

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307828

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—447 **11 Claims**



1. A fuel injection apparatus for internal combustion engines, comprising

at least one pump piston guided inside a pump housing of a fuel injection pump in an axially and rotationally movable manner in a pump cylinder and acting upon a pump work chamber between said pump piston and a supply pressure valve, said piston being actuated by a cam drive, the pump piston being provided with first and second control locations axially offset from one another, of which said first control location is embodied by an oblique control edge and in order to terminate the effective supply stroke opens an overflow conduit disposed separately from an inflow opening in the pump cylinder and upon the return stroke of the pump piston enables a refilling of the return-flow fuel quantity that had been diverted from said chamber following the end of supply and thereby fixes the instant of supply onset;

a fuel reservoir connectable with the pump work chamber via the overflow conduit;

said pressure supply valve closing off the pump work chamber on the supply side;

an adjusting device serving to rotate the pump piston and actuatable by a mechanical adjusting member;

an electromechanically actuatable metering valve supplying the pump work chamber with fuel via the inflow conduit, said metering valve, with its opening duration, determining a fuel injection quantity pre-stored in the pump work chamber;

said fuel reservoir embodied as a refill reservoir receiving the entire return-flow fuel quantity diverted after the end of supply and forcing the entire return-flow fuel quantity back into the pump work chamber prior to the next subsequent supply stroke, the refill reservoir including a reservoir chamber and a reservoir piston displaceable therein counter to the force of a restoring spring; said reservoir piston including a bottom facing towards said pump work chamber and filling an end portion of said reservoir chamber facing said pump work chamber when in its nondisplaced position;

said overlow conduit representing the sole and direct connection between the refill reservoir and the pump work chamber and openable by said first and second control locations of the pump piston;

the pump housing comprising two housing parts threaded together in a plane of division extending at right angles to the longitudinal axis of the pump piston, said two housing parts being, respectively a lower housing part which receives at least the adjusting device, and a cylinder head which receives at least the pump cylinder and the supply pressure valve; and

the cylinder head also, including a first receiving bore connected to the overflow conduit which receives the refill reservoir and, a second receiving bore which communicates with the inflow conduit, and contains the metering valve.

4,526,151

FUEL INJECTION DEVICE

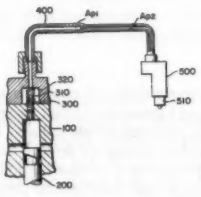
Mataji Tateishi; Etsuo Kunimoto, and Tatsuo Takaishi, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

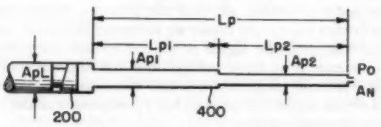
Filed Feb. 28, 1983, Ser. No. 470,492

Claims priority, application Japan, Mar. 12, 1982, 57-38178; Oct. 14, 1982, 57-15438[U]; Oct. 14, 1982, 57-15439[U]; Oct. 22, 1982, 57-158919[U]; Oct. 22, 1982, 57-158920[U]

Int. Cl.³ F02M *55/02*

U.S. Cl. 123—468 **6 Claims**





1. A fuel injection device, comprising:

a fuel pump;

a fuel injection nozzle; and

a longitudinally extending fuel injection pipe, circular in

cross section all along the length thereof, having opposite first and second ends, respectively connected at said first and second ends to said fuel injection pump and said fuel injection nozzle;

said fuel injection pipe consisting of first, second and third longitudinally extending pipe sections connected end-to-end, said first pipe section connected to said fuel pump and having an inner diameter which is constant all along its length, said third pipe section being connected to said nozzle and having an inner diameter which is constant all along its length, said second pipe section having opposite third and fourth ends and being respectively connected at said third and fourth ends to adjacent ends of said first and third pipe sections;

said second pipe section having an inner diameter which continuously decreases all along its length from said third end to said fourth end.

4,526,152

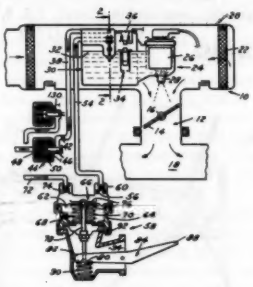
LOW PRESSURE LOW COST AUTOMOTIVE TYPE FUEL INJECTION SYSTEM

Laszlo Hideg, Dearborn Heights; Paul L. Koller, Wyandotte, and Rogelio G. Samson, Bloomfield Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 12, 1984, Ser. No. 570,052

Int. Cl.³ F02M *39/00, 37/20*

U.S. Cl. 123—478 **7 Claims**



1. A single point low pressure fuel injection system for an automotive type engine, the system including an air throttling body having an induction passage with an electromagnetically operated centrally located fuel injector projecting axially into one end, the passage being connected at its opposite end to the engine intake manifold and having a throttle valve between the injector and manifold rotatably mounted for a movement between positions variably opening and closing the passage,

a closed fuel chamber containing liquid fuel,

a low pressure engine camshaft driven mechanical fuel pump having an inlet from a fuel tank and an outlet connected to an inlet to the chamber near the top thereof to provide fuel under low pressure thereto in the range of 2–10 psi or thereabouts, a fuel return flow line to the fuel tank connected to the chamber above the chamber inlet and containing a flow restrictor therein,

the injector having a body portion immersed in the chamber for supplying fuel to the injector and cooling the injector,

an air cleaner assembly surrounding the chamber for directing cooling air past the chamber into the induction passage,

and fuel pressure regulator means in the chamber to pressurize the chamber to the injector injection pressure level, the level being slightly lower than the output pressure level of the pump, the pressurization of the chamber effecting a quick purging from the chamber upon operation of the pump of any fuel vapors developed from hot soak or hot fuel handling engine operations to maintain a constant fuel pressure to the injector at all times, the pressure regulator means including a fuel pressure accumulator in the chamber including spring biased piston means displaceable by the fuel pressure to an energy storage position, the maximum accumulator displacement volume being greater than the greatest engine liquid fuel volume delivery requirements during any one engine cycle of operation to maintain a constant fuel injection pressure level at all times regardless of the fuel pump fuel output volume level.

4,526,153

AIR-FUEL RATIO CONTROL METHOD FOR AN INTERNAL COMBUSTION ENGINE FOR VEHICLES IN LOW LOAD OPERATING REGIONS

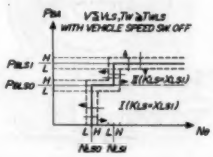
Shumpei Hasegawa, Niiza; Osamu Gotoh, Higashikurume, and Yutaka Otobe, Shiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,671

Claims priority, application Japan, Jun. 25, 1982, 57-109197

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—480 **12 Claims**



1. A method for electronically controlling the air-fuel ratio of an air-fuel mixture being supplied to an internal combustion engine for use in a vehicle, in response to operating conditions of said engine, the method comprising the steps of: (1) setting beforehand a plurality of different operating regions of said engine, each defined by predetermined values of first and second parameters indicative of operating conditions of said engine; (2) detecting values of said first and second parameters; (3) detecting the speed of said vehicle; (4) comparing a value of the speed of said vehicle detected in said step (3) with a predetermined value, (5) selecting from said plurality of different operating regions first and second predetermined mixture-leaning regions wherein leaning of said mixture is required to control the air-fuel ratio of said mixture to a value leaner than a theoretical mixture ratio, respectively, when said detected value of said speed of said vehicle is lower than said predetermined value and higher than same, the total range of said first predetermined mixture-leaning region being smaller than that of said second predetermined mixture-leaning region; (6) determining whether or not said engine is operating in one of said first and second predetermined mixture-leaning regions selected in said step (5), from values of said first and second parameters detected in said step (2); and (7) effecting leaning of said mixture when it is determined in said step (6) that said engine is operating in said selected one operating region.

4,526,154

TIMING CONTROL MECHANISM FOR A FUEL INJECTION PUMP

Robert A. DiDomenico, Ludlow, Mass., assignor to AMBAC Industries, Incorporated, Springfield, Mass.

Filed Dec. 27, 1982, Ser. No. 453,854

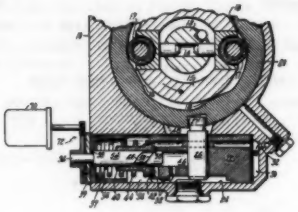
Int. Cl.³ F02D *1/02;* **F02M** *45/00*

U.S. Cl. 123—502 **9 Claims**

1. In a timing control mechanism for an engine-driven fuel injection pump, the pump being of the kind comprising a rotor, said rotor rotating in a particular direction and including a plunger located within a bore, adjustable annular cam means

for effecting movement of the plunger, a fluid pressure-operable timing piston operatively connected to said cam means for adjusting the setting of the cam means to control injection timing, said timing piston operating only axially in a cylinder, said cam means being urged in said particular direction by engagement, at least indirectly, with said rotor and thereby urging said timing piston in said particular direction, fluid being supplied to an end of said cylinder for applying a force in one direction on an end of the timing piston, biasing means operating on said piston in opposition to said fluid force, and positioning means including an electric rotary actuator, for controlling the positioning of the timing piston, the improvement wherein:

said piston includes an axial bore in one end thereof, a delivery passage extending in said piston from said fluid supply in the cylinder to intersection with the sidewall of said bore at a control orifice, discharge passage means extending from said piston bore to a relatively low pressure region of the pump, and said electric rotary actuator is drivingly connected to a rotary shaft extending axially into said cylinder and into said piston bore, said shaft



being axially stationary and having affixed thereto a flow-occluding valve surface terminating in a control edge, said flow-occluding valve surface preventing fluid flow through a certain portion of the total area of said control orifice in a steady-state condition and said control edge being inclined to the shaft axis such that rotation of the shaft effects temporary axial displacement of said edge relative to said control orifice in the piston bore whereby to temporarily vary flow through said control orifice to said discharge passage means and thereby cause said piston to axially track said control edge, said fluid force applied to said end of said piston being in opposition to said particular direction in which said piston is urged by said rotor and cam means, and said flow-occluding valve surface being positioned relative to said valve control edge, toward that said end of said piston receiving said fluid force such that when said timing piston is urged in said particular direction the flow through said piston control orifice is relatively reduced to relatively increase said fluid force on said piston end and thereby stabilize said timing piston.

4,526,155

PRESSURE REGULATING SYSTEM

Adrianus M. M. van den Wildenberg, Geldrop, and Andreas L. M. T. Smeets, Eindhoven, both of Netherlands, assignors to Vialle B.V., Eindhoven, Netherlands

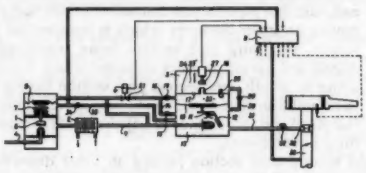
Filed Feb. 6, 1984, Ser. No. 577,110

Claims priority, application Netherlands, Feb. 4, 1983, 8300438

Int. Cl.³ F02M *21/02*

U.S. Cl. 123—525 **23 Claims**

1. A pressure regulating amplifier system for an internal combustion engine or the like comprising a first and a second inlet conduit opening in a first chamber, through which gas is supplied under constant pressure, the first inlet conduit being separated from the first chamber by a valve connected with a diaphragm and the second inlet conduit comprising an adjustable restriction, through which a constant small quantity of gas is supplied to the first chamber, an outlet conduit directly connected to the first chamber and connected to the inlet of the internal combustion engine or the like, and a second chamber being separated from the first chamber by the diaphragm, a



third inlet conduit connected to the second chamber, said third inlet conduit being provided with an adjustable restriction, through which a constant small quantity of gas is supplied to the second chamber and the second chamber is connected to the first chamber outlet conduit through a variable restriction.

4,526,156

AIR INTAKE FOR AN AIR FILTER OF AN INTERNAL COMBUSTION ENGINE

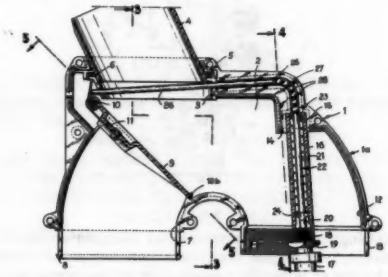
Paul Briche, Tourcoing, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Jul. 5, 1984, Ser. No. 628,089

Claims priority, application France, Jul. 8, 1983, 83 11441

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—552 **9 Claims**



1. An air intake neck for an air filter of an internal combustion engine, said neck comprising a body having two semi-shells which are interconnected in a joint plane and define a mixing chamber, a cold air conduit and a hot air conduit both opening onto said chamber, an outlet conduit for the mixed air mixed in said mixing chamber and communicating with said hot air and cold air conduits, a thermostatically adjustable flap which is capable of separating the hot air conduit from the mixing chamber, a flap-actuating tab connected to the flap, a thermometric sensor connected to the body and located in a position in which said mixed air travels thereover and incuding a movable output element, and a linkage connecting the sensor to the flap for controlling the position of the flap, the linkage comprising a first transmission rod in contact with said movable output element of the thermometric sensor, a second rod in contact with the actuating tab of said flap, and motion direction changing means comprising elements permitting a transmission of force from the output element to the actuating tab with a modification in the direction of said force, said first transmission rod, said second transmission rod and said motion direction changing means being mounted to be movable exclusively in translation in said body and at least one of said transmission rods being slidably mounted in said plane of said body.

4,526,157
AUTO IGNITION CONVERSION APPARATUS AND METHOD

Theos E. Theofanous, 4747 Kester Mill Rd., Winston-Salem, N.C. 27103

Filed Mar. 30, 1983, Ser. No. 480,841
Int. Cl.³ F02P 1/00
U.S. Cl. 123—595 8 Claims

1. Apparatus for converting an electronic automotive engine ignition system of the type having:

(a) a distributor with a stator and rotor assembly;

(b) a cover releasably securable to the stator in a fixed position corresponding to the ignition timing and having contacts and wiring receptacles for the engine coil and spark plugs enabling high voltage pulses transmitted from the coil to be transferred to the spark plugs;

(c) a shaft rotatable within and relative to the stator according to engine speed and having intermediate the length thereof an integral slotted flange providing an annular seating surface surrounding the shaft and in a plane perpendicular to the longitudinal axis thereof and through the width of said flange some predetermined number of slots at least one of which is of unique width compared to the remainder of such slots and located in a position corresponding to the timing of said engine;

(d) a vacuum control unit mounted on said stator and having an operating arm extending into said stator;

(e) a pair of prelocated fastener holes in said stator for receiving and supporting a mounting plate assembly surrounding said shaft and having a central opening providing clearance for passage of said flange therethrough when said plate assembly is secured in a plane perpendicular to the longitudinal axis of said shaft;

said apparatus comprising:

(f) a slip fit timing cam mounted on said shaft and having a bottom surface portion seated on said flange seating surface and at least one tab fitting only said slot of unique width forming a drive base connection;

(g) means for securing said cam on said shaft against said flange;

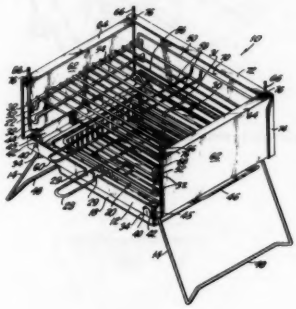
(h) a mounting plate assembly surrounding said shaft and having a central opening providing clearance for passage of said flange therethrough, said plate assembly residing when secured in a plane perpendicular to the longitudinal axis of said shaft and having upper and lower plate members, said lower plate member having a pair of pre-located fastener holes mating said pair of pre-loaded fastening holes in said stator enabling said plate assembly to be secured thereto, said upper plate member being mounted for limited rotation on said lower plate member and having connector means enabling said lower plate member to be detachably connected to said vacuum control unit operating arm for effecting said limited rotation and thereby controlling the relative positions of said upper and lower plate members in correspondence with advancing and retarding the timing of said engine; and

(i) a breaker point and condensor assembly mounted on the upper said plate member and having means for appropriately electrically connecting the points and condensor of said assembly to the coil of said ignition system, said breaker point assembly being fixedly positioned on said upper plate and having means for wiping said cam for effecting the opening and closing the points of said assembly in timed relation to the speed of said engine.

4,526,158
PORTABLE BARBECUE SYSTEM

James F. Lee, 218-12 43rd Ave., Bayside, N.Y. 11361

Filed Jun. 25, 1984, Ser. No. 624,144
Int. Cl.³ F24C 1/16
U.S. Cl. 126—9 R 20 Claims



1. A portable barbecue comprising:

a frame with an open center having front, rear and side walls and an inwardly extending annular bottom flange;

first and second leg members hingedly engaging said frame to assume a first, folded position juxtaposed to the bottom of said frame and a second, supporting position extending away from the bottom of said frame;

first and second grill rack members hingedly engaging said frame to assume a first, closed position juxtaposed to the top of said frame and a second, upright position extending upwardly from the top of said frame;

a disposable heat reflecting drip pan having an outwardly extending annular lip adapted to engage said annular bottom flange on said frame such that said drip pan assumes a working position occupying the open center of said frame when said leg members are in said second, supporting position;

a removable fire basket engaging said frame and overlying said disposable drip pan in said working position; and

a removable cooking grill adapted to slidably mount across said first and second grill rack members.

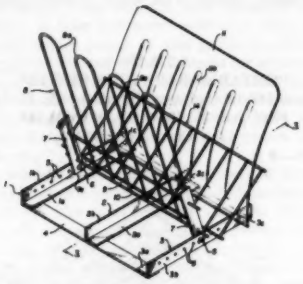
4,526,159
FIREPLACE GRATE

Ray L. Vroome, 43 Lawson Dr., Madison, Conn. 06443

Filed Jun. 5, 1984, Ser. No. 617,602
Int. Cl.³ F23H 13/00
U.S. Cl. 126—164 10 Claims

1. A fireplace grate comprising, a base having a plurality of horizontally disposed angle irons, each angle iron having a horizontal leg and a vertical leg, a transversely extending frame member connected to the horizontal legs of said angle irons for holding said angle irons in parallel, spaced relationship to each other, a heat radiating back wall detachably connected to said base, a wire grill detachably connected to said base and positioned forwardly of the back wall, whereby the space between the back wall and the grill is adapted to receive a single row of vertically stacked logs, and a mounting plate positioned adjacent the vertical leg of each outboard angle iron, the end of each mounting plate abutting the horizontal leg

of its respective angle iron and the side surface of each mounting plate abutting the surface of the vertical leg of the respective angle iron, said grill being connected to said mounting plates.



4,526,160

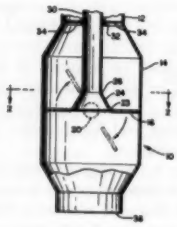
APPARATUS FOR CONTROLLING FLOW OF COMBUSTION PRODUCTS

John C. Ickes, 2017 S. Florida, Joplin, Mo. 64801

Filed Jun. 2, 1980, Ser. No. 155,610

Int. Cl.³ F23L *3/00*

U.S. Cl. 126—292 **10 Claims**



1. Apparatus for cooperation with an associated flue, having a first axis extending away from a point proximate to an associated combustion chamber, which comprises:

a funnel shaped member having first and second ends, said second end being larger than said first end;

a damper having a generally central bore disposed in the associated flue;

means for mounting said damper in said associated flue for rotation about a second axis which is generally perpendicular to said first axis;

means for mounting said funnel shaped member with said first end higher than said second end and with said second end extending into said damper, said means for mounting said damper comprises at least one rod shaped member extending through at least one wall of the associated flue and said means for mounting said funnel shaped member comprising a plurality of elongated members extending radially from said funnel shaped member to the associated flue; and

said apparatus further includes first and second generally planar members carried in said second end of said funnel shaped member, said generally planar members being mounted for fluid sealing engagement with the interior of the said second end of said funnel shaped member.

4,526,161

SOLAR ROOF ASSEMBLAGE AND INTERNALLY REMOVABLE SOLAR TRANSPARENT ROOF COVER

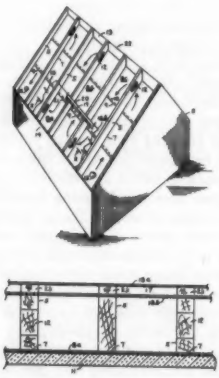
Francis A. Kaicher, P.O. Box 643, Highland Lakes, N.J. 07422

Continuation of Ser. No. 246,742, Mar. 23, 1981, abandoned.

This application Apr. 5, 1984, Ser. No. 597,174

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—444 **13 Claims**



1. An integrated roof structure for a building, the roof structure being capable of collecting solar energy for use in the building, said roof structure comprising:

a plurality of rafters extending generally parallel to one another and spaced laterally from one another, said rafters each having a top surface and an opposite bottom surface;

an outer roof cover juxtaposed with the top surfaces of the rafters and laterally spanning said plurality of rafters, the outer roof cover including solar energy transparent portions located between adjacent rafters;

an inner roof cover including a structurally reinforcing sheet comprising solar energy absorptive material, such as metal, said sheet being juxtaposed with the bottom surfaces of the rafters and laterally spanning said plurality of rafters, to provide structural reinforcement and solar energy absorptive surfaces between said adjacent rafters;

first securing means securing the inner roof cover to the bottom surfaces of the rafters for establishing a laterally reinforced integrated rafter and inner roof cover structure;

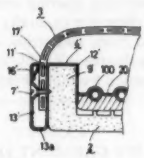
second securing means securing the outer roof cover to the top surfaces of the rafters, with the solar energy transparent portions confronting the solar energy absorptive surfaces of the inner roof cover, to establish solar energy collecting bays bounded by adjacent rafters and the upper and lower roof covers; and

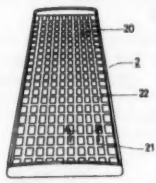
passage means associated with the solar energy collecting bays to enable the flow of an energy transfer fluid between the bays, and the attendant transfer of solar energy collected in each bay.

4,526,162
SOLAR HEAT COLLECTOR ASSEMBLY

Nobushige Arai, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 485,296, Apr. 15, 1983, abandoned.
This application Aug. 6, 1984, Ser. No. 637,690
Claims priority, application Japan, Oct. 29, 1982, 57-164793[U]
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 3 Claims





1. A solar heat collector assembly comprising in combination:

a heat collector means,

a top cover means for the heat collector means, and

a base means for accommodating said heat collector means made of a foamed resinous heat insulating material, said base means having a latticed rib configuration extending therefrom, said latticed rib configuration comprising a multiplicity of ribs defining a plurality of rectangularly shaped concavities therebetween wherein said top cover means joins with said base means in housing said heat collector means, said top cover means containing a plurality of air cavities which serve as heat insulators for increasing the heat insulating efficiency of said assembly,

wherein the height of the ribs is about one-half to about the same size as the thickness of the base from which the ribs extend and the width of the ribs projected on the bottom surfaces of the base means is about the same size and up to about twice the size of the thickness of the base.

4,526,163
MASSAGER

Merle Fedders, 371 North St., Meadville, Pa. 16335

Filed Sep. 30, 1982, Ser. No. 431,032
Int. Cl.³ A61H 7/00
U.S. Cl. 128—56 4 Claims

1. A massage device comprising, a first disk,

a first central shaft having a first and second end, said first central shaft extending through said first disk and rotatably supported thereon,

a first body engaging means, said first body engaging means being supported on said second end of said first central shaft,

a first driving means, said first driving means being supported on said second shaft on the side of the first disk remote from said first body engaging means,

a second shaft having first and second ends, said second shaft extending through and rotatably supported on said first disk and being transversely spaced from the longitudinal axis of said first central shaft,

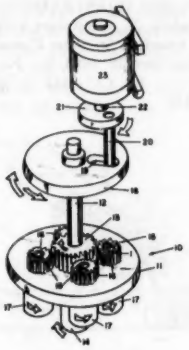
a second body engaging means on said second end of said second shaft,

a second driving means located on said first end of said second shaft and said second driving means engaging said first driving means,

a second disk, said second disk being connected to said first end of said first shaft,

said second disk having a radially extending slot therein,

a motor means having an eccentric crank pin thereon,



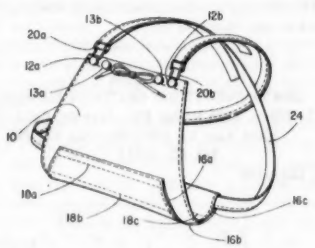
said eccentric pin being received in said radially extending slot whereby rotation of said crank pin oscillates said first central shaft in a first direction and then in a second direction whereby said first body engaging means is rotated in a first direction and then in a second direction,

said second body engaging means is rotated in a second direction and then a first direction respectively, whereby the body of a person engaged by said first body engaging means and said second body engaging means is given an invigorating massage when said motor means oscillates said first central shaft.

4,526,164
UNIVERSAL SIZE ARM SLING

Claudia J. Bihl, Franklin Furnace, Ohio, assignor to Theodore A. Kirby, Jackson, Ohio

Filed Jul. 11, 1983, Ser. No. 512,468
Int. Cl.³ A61F 5/40
U.S. Cl. 128—94 9 Claims



1. A universal arm sling for support of either a left arm or a right arm comprising:

(a) an elongated flexible panel having an upper portion and a lower portion;

(b) a plurality of substantially parallel passageways formed laterally across said lower portion of said elongated flexi-

ble panel the passageways being formed one above the other;

(c) a flexible belt with two opposite ends and extending through one of said passageways thereby permitting selectable adjustability in the vertical length of said elongated flexible panel; and

(d) fastener means affixed to the ends of said flexible belt and to the upper portion of said elongated flexible panel for releasably attaching the ends of said belt to the top of said panel.

4,526,165

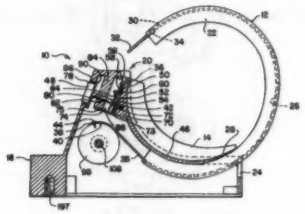
APPARATUS FOR CONSTRAINING A HUMAN LIMB

Thaddeus J. Mielnik, Jr., and Robert A. Wolff, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Oct. 28, 1983, Ser. No. 546,277

Int. Cl.³ A61F *13/00*

U.S. Cl. 128—133 **7 Claims**



1. Apparatus for restraining movement of a portion of a human limb comprising:

a restraint adapted to encircle the limb including a member that is adapted to contact the limb along its entire circumference and that is constructed from a shock absorbing material, said restraint being a restraining member defining at least one padded restraint; and

a support adapted for mounting to a surgical table, said support having means for selectively tightening said restraint around the limb to cause said restraint to exert force against the limb that is substantially uniform along its circumference;

said tightening means tightening said restraint around the limb by reducing the length of the portion of said restraint that bears against the limb, said tightening means including a spool mounted to said support for rotational movement relative to said support, one end of said padded restraint being secured to said spool, rotation of said spool causing said padded restraint to wrap around or unwrap from said spool to tighten or loosen, respectively, said padded restraint around the limb, and an operator operably connected to said spool for causing rotation of said spool when said operator is rotated in one direction only.

4,526,166

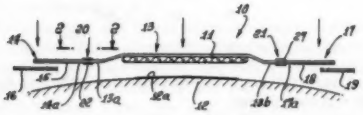
DISCONNECTIBLE SECTION BANDAGE

Arthur L. Silber, 1425 Rodeo Rd., Arcadia, Calif. 91006

Filed Aug. 12, 1983, Ser. No. 522,789

Int. Cl.³ A61L *15/00*

U.S. Cl. 128—156 **7 Claims**



1. In a disconnectible section bandage, the combination comprising

(a) a liquid absorbent, soft, pad of material adapted to be placed over a wound,

(b) a first strip carrying said material,

(c) second and third strips each carrying an adhesive adapted to be pressed onto skin areas spaced from the wound, and

(d) primary and secondary releasable attachments respectively interconnecting said second and third strips said first strip widthwise thereof and adapted to be manipulated to free the connection therebetween each, said attachment comprising a string means adapted to be pull-displaced in a direction generally widthwise of the strips, to be removed from said strips, whereby said first strip being free of adhesive is liftable from the wound without restriction imposed by the adhesive.

4,526,167

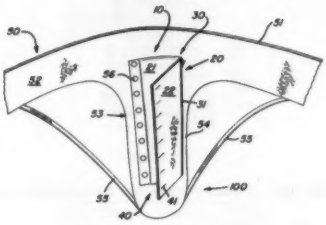
SUPPORT GARMENT FOR MALES

Harry R. Ebenal, deceased, late of Daly City, Calif., and by Gladys M. Ritter, executrix, 53 Cliffside Dr., Daly City, Calif. 94150

Filed May 24, 1983, Ser. No. 497,765

Int. Cl.³ A61F *5/40*; A41B *9/12*

U.S. Cl. 128—158 **7 Claims**



1. In combination with a male undergarment, comprising an elastic waist band and a front panel, an improvement comprising:

an elongated soft cloth rear envelope forming panel, releasably secured along at least one vertical edge, to the front panel of said male undergarment, to form a vertically disposed enclosure for an erect male organ; wherein, the elongated rear envelope panel is releasably secured to the front panel of said male undergarment, along both vertical edges.

4,526,168

APPARATUS FOR DESTROYING CALCULI IN BODY CAVITIES

Dieter Hassler; Heinz Kresse, both of Uttenreuth; Helmut Reichenberger, Eckental, and Georg Naser, Zirndorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 26, 1982, Ser. No. 371,924

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119295

Int. Cl.³ A61B *17/22*

U.S. Cl. 128—303 R **12 Claims**

1. Apparatus for destroying concrements in a body cavity, comprising

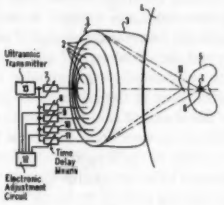
(a) an ultrasonic transducer for generating ultrasonic energy pulses, each ultrasonic energy pulse transforming to a shock wave during propagation,

(b) means for exciting said ultrasonic transducer to generate ultrasonic energy pulses with each pulse having a pulse peak power of at least one hundred kilowatts,

(c) means for electrically focusing said ultrasonic energy pulses to a focal zone,

said ultrasonic transducer having an emission surface area which is greater than 100 cm^2,

said ultrasonic transducer emitting in operation said ultrasonic energy pulses, each pulse having a pulse peak power of at least one hundred kilowatts distributed over said surface area, such that the ultrasonic energy per square unit along the transmission path is sufficiently small so as to avoid tissue damage, on the one hand, but is sufficiently



large at said focal zone that it suffices for destroying the concrement disposed in the region of said focal zone, on the other hand,

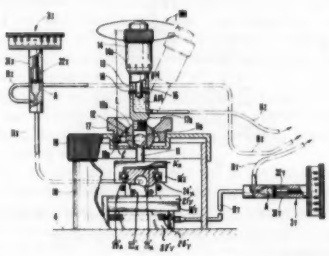
wherein said ultrasonic transducer comprises a plurality of piezoelectric transducer elements, and wherein said means for electrically focusing comprises electronic circuit means for triggering said piezoelectric transducer elements in a predetermined time sequence at different times.

4,526,169

FINE CONTROL SYSTEM FOR A GLASS ELECTRODE OR THE LIKE

Eiichi Narishige, and Shinji Yoneyama, both of Tokyo, Japan, assignors to Narishige Scientific Instrument Laboratory, Ltd., Japan

Filed Jul. 5, 1983, Ser. No. 511,002
Claims priority, application Japan, Feb. 21, 1983, 58-27478
Int. Cl.³ A61B *17/36*
U.S. Cl. 128—303 B **10 Claims**



1. A system for finely and precisely controlling the position of a glass electrode or the like comprising:

a control stand for locating the glass electrode or the like as required in the directions of X-, Y- and Z-coordinates, said control stand including first, second and third actuator means mounted on said control stand for respectively actuating the glass electrode or the like in the directions of the X-, Y- and Z-coordinates, each said first, second and third actuators including a cylinder member and a slide,

first fine adjusting means operatively connected to said first and second actuator means for roughly adjusting said first actuator means and said second actuator means to responsively roughly adjust said glass electrode or the like in the X- and Y-coordinates, respectively, said rough adjustment being effected with both hands operation of an operator,

second fine adjusting means operatively connected to said first, second and third actuator means for (a) adjusting said third actuator means to responsively finely adjust said glass electrode of the like in the Z-coordinate and for finely adjusting said first and second actuator means to responsively finely adjust said glass probe or the like in the X-coordinate and the Y-coordinate, respectively with one hand operation of the operator, and

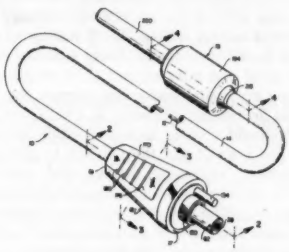
hose means for establishing operative hydraulic communication between the control stand, the first fine adjusting means and the second fine adjusting means.

4,526,170

DETACHABLE LASER OPTICAL FIBER ASSEMBLY AND METHOD OF ADJUSTMENT

Howard M. C. Tanner, Salt Lake City, Utah, assignor to HGM, Inc., Salt Lake City, Utah

Filed Mar. 23, 1983, Ser. No. 478,158
Int. Cl.³ A61B *17/36*
U.S. Cl. 128—303.1 **1 Claim**



1. In a laser system, in combination:

(a) laser apparatus having:

(i) a cylindrical laser beam connector receptacle for receiving a cylindrical connector plug forming part of the proximal end of a detachable optical fiber assembly connecting said laser apparatus to a laser instrument;

(ii) a flat surface surrounding the entrance to said connector receptacle;

(iii) means providing a laser beam source positioned on the axis of said connector receptacle; and

(iv) offset from said laser beam connector receptacle a cylindrical guide pin receptacle with an entrance surrounded by said flat surface and concentric with an axis parallel to the axis of said laser beam connector receptacle;

(b) a laser instrument operative with said laser beam and having a cylindrical instrument receptacle for receiving a cylindrical connector plug forming part of the distal end of a detachable optical fiber assembly connecting said laser apparatus and instrument;

(c) an elongated flexible optical fiber structure comprising:

(i) a central optical fiber core for transmitting said beam;

(ii) optical transmission enhancement cladding covering said fiber core;

(iii) a tubular fiber core protective sheath loosely surrounding said core and cladding for a major portion of the length thereof, said protective sheath terminating inwardly from each of the respective proximal and distal ends of said core and cladding, said core being relatively fragile with respect to the fragility of said core protective sheath; and

(iv) a ferrule surrounding and secured to said protective sheath at each of the respective proximal and distal ends thereof enabling stress applied to said ferrules and thus to said protective sheath to be isolated from the more fragile said optical fiber core;

(d) a proximal connector assembly mated to said laser apparatus connector and pin receptacles for connecting the proxi-

mal end of said optical fiber structure to said laser apparatus, comprising:

(i) a first tubular substantially rigid sheath having a first concentric bore extending from its distal end for a major portion of its length and a second concentric bore of reduced diameter at its proximal end, a proximal end portion of said optical fiber core and cladding located outwardly from the proximal end of said fiber core protective sheath being loosely confined in said first bore and fixedly concentrically secured in said second bore with the extreme proximal end of said fiber core extending beyond the proximal end of said first sheath;

(ii) a second substantially rigid tubular sheath concentrically mounted on said first said tubular sheath and extending from the distal end of said first sheath for a major portion of the length of said first sheath, said second sheath being secured to said first sheath for adjustable lengthwise positioning thereon;

(iii) a third substantially rigid tubular sheath having enlarged concentric bores formed at the proximal and distal ends thereof and therebetween a concentric connecting bore of reduced size defined by an internally-formed annular shoulder, said second tubular sheath having its proximal end seated in said shoulder and being mounted within the enlarged distal end bore of said third sheath to allow vertical and horizontal positioning therein, the proximal end of said first sheath extending in a proximal direction from said shoulder being mounted within the enlarged proximal end bore of said third sheath to allow vertical and horizontal positioning therein, said third tubular sheath at its proximal end being precision formed to mate and snugly fit within said laser apparatus receptacle and thereby locate the extreme proximal end of said optical fiber core proximate said laser beam source;

(iv) a fourth tubular sheath threadably secured at its proximal end to a mated distal end of said third tubular sheath, having an enlarged bore at its distal end and a connecting bore of reduced diameter formed by an internally-formed annular shoulder, said ferrule at the proximal end of said optical fiber structure protective sheath being releasably secured within the said enlarged bore at the distal end of said fourth sheath;

(v) a compression spring seated between said fourth sheath annular shoulder and the distal end of said second tubular sheath and operative to resiliently force the proximal end of said second tubular sheath into a seated position in said third tubular sheath annular shoulder while permitting at least limited vertical and horizontal positioning of the distal end of said second sheath within the enlarged bore within the distal end of said third sheath;

(vi) a plurality of set screws mounted in spaced circumferential positions in said third tubular sheath and adjustably positioned in contact with the outer surface of a distal end portion of said second tubular sheath, selected ones of said set screws being adjustable to tilt said second sheath both vertically and horizontally on said third tubular sheath annular shoulder to precisely align the extreme proximal end of said optical fiber with said laser apparatus source;

(vii) a collar concentric with and adjustably mounted for lengthwise positioning on said third tubular sheath and having a proximal end portion thereof engagable with said laser apparatus flat surface to control the depth of insertion of said third sheath proximal end in said laser apparatus receptacle;

(viii) a guide pin secured in said collar and located on an offset axis parallel to the axis of said collar and being adapted to fit into said guide pin receptacle for aligning the proximal end of said third sheath with said laser apparatus receptacle; and

(ix) a cover surrounding said collar, third and fourth tubular sheaths and removably secured to said fourth tubular sheath; and

(e) a distal connector assembly for connecting the distal end of said optical fiber structure to said laser instrument, comprising:

(i) a fifth tubular substantially rigid sheath having a first concentric bore extending from its proximal end for a major portion of its length and a second concentric bore of reduced diameter at its distal end, a distal end portion of said optical fiber core and cladding located outwardly from the distal end of said fiber core protective sheath being loosely confined in said fifth sheath first bore and fixedly concentrically secured in said fifth sheath second bore with the extreme distal end of said fiber core extending beyond the distal end of said fifth sheath;

(ii) a sixth substantially rigid tubular sheath having a first concentric bore at the outer distal end thereof surrounding the distal end of said fifth sheath and the distal end of said fiber core, a second concentric bore extending for a major portion of the length thereof and a third concentric bore formed by an internally-formed annular shoulder and communicating said sixth sheath first and second bores, a distal outer end portion of said sixth sheath being adapted to mate and fit in said laser instrument receptacle and having a larger proximal end portion;

(iii) a cover having its distal end releasably secured to said sixth sheath larger proximal end portion; and

(iv) means securing the other of said ferrules at the distal end of said optical fiber structure in a manner enabling force transmitted thereto to be transferred to said sixth sheath.

4,526,171

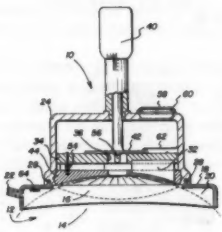
CORNEA INCISION DEVICE

Ronald A. Schachar, 1020 N. Highway 75, Denison, Tex. 75020

Filed Jan. 15, 1980, Ser. No. 112,328

Int. Cl.[3] **A61B** *17/32*

U.S. Cl. 128—305 **22 Claims**



1. A device for forming surface incisions of a desired pattern and depth on the cornea of an eye comprising:

(a) a housing;

(b) at least two cutting blades in a predetermined array for producing a desired pattern of surface incisions;

(c) means for positioning said housing in an operative position over the eye;

(d) a blade platform contained within said housing, said blade platform having said cutting blades mounted thereto in said array;

(e) means for guiding and advancing said blade platform in a direction towards and into the surface of the cornea to simultaneously incise a plurality of incisions in accordance with the predetermined pattern of said array, said direction being substantially normal to the cornea surface at the cornea center;

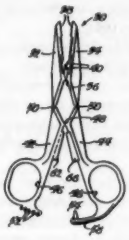
(f) means for controlling the depth of the incisions; and

(g) means for retracting said cutting blades from said cornea after forming the incisions.

4,526,172
ONE PIECE MULTI-PURPOSE CLAMP

Stanley Stephenson, Huntington Beach, Calif., assignor to Premium Plastics, Inc., Chicago, Ill.

Filed Aug. 25, 1983, Ser. No. 526,448
Int. Cl.³ A61B 17/28
U.S. Cl. 128—322 **12 Claims**



1. A clamp, comprising:

a pair of pincer portions each having a clamping surface at respective ends thereof;

a pair of handle portions each defining grip means adapted for manipulation by hand;

means interconnecting said pincer portions and said handle portions whereby movement of said grip means of said handle portions toward each other moves said clamping surfaces of said pincer portions toward each other for creating a clamping force between said clamping surfaces;

locking means provided on said handle portions, said locking means being adapted to releasably interengage and coact when said grip means of said handle portions are moved toward each other for maintaining said clamping force between said clamping surfaces, said locking means being disengagable by relative disengaging movement of said handle portions; and

means for resisting said relative disengaging movement of said handle portions for resisting disengagement of said locking means after said locking means have been engaged,

said resisting means comprising abutment surfaces respectively provided on said handle portions, said abutment surfaces being engageable with each other when said locking means are engaged for resisting relative disengaging movement of said handle portions,

said locking means on each of said handle portions comprising at least one locking tooth on each of said handle portions, said locking teeth being adapted to releasably interengage for maintaining said clamping force,

said resisting means further comprising offset means on said locking teeth for resisting relative disengaging movement of said handle portions in a first direction when said locking teeth are interengaged, said abutment surfaces being engageable with each other for resisting relative disengaging movement of said handle portions in a second direction generally opposite said first direction.

4,526,173
SKIN CLOSURE DEVICE

Joseph C. M. Sheehan, Burr Ridge, Ill., assignor to Kells Medical, Inc., Burr Ridge, Ill.

Continuation-in-part of Ser. No. 367,671, Apr. 12, 1982, abandoned. This application Mar. 10, 1983, Ser. No. 472,053
Int. Cl.³ A61B 17/08
U.S. Cl. 128—335 **36 Claims**

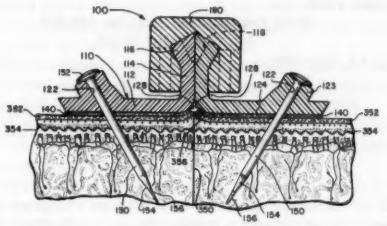
1. A closure device for a skin wound which defines two marginal edges, each of which comprises a superficial skin layer and an internal skin layer, said device comprising:

means for defining first and second surfaces adapted to be positioned at respective sides of the skin wound;

pin means for mechanically engaging the two internal skin layers near the two marginal edges of the wound to respective ones of the first and second surfaces;

adhesive means for adhesively bonding exterior surfaces of the two superficial skin layers closely adjacent to the two marginal edges of the wound to respective ones of the first and second surfaces, said adhesive means extending between the first and second surfaces and the superficial skin layer into a region between the pins and the marginal edges of the wound; and

means, coupled to the first and second surfaces, for positioning the first and second surfaces to hold the two superficial skin layers together in alignment, and for simultaneously positioning the pin means to hold the two internal skin layers together in alignment, in order to promote rapid healing of the skin wound and to minimize the formation of scar tissue;

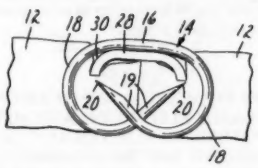


said pin means and said first and second surfaces configured to allow the first and second surfaces to be adhesively bonded to the exterior surafces of the two superficial skin layers prior to engagement of the pin means with the internal skin layers.

4,526,174
STAPLE AND CARTRIDGE FOR USE IN A TISSUE STAPLING DEVICE AND A TISSUE CLOSING METHOD

Harold E. Froehlich, St. Anthony, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 248,575, Mar. 27, 1981, abandoned. This application Nov. 7, 1983, Ser. No. 550,053
Int. Cl.³ A61B 17/10
U.S. Cl. 128—335 **6 Claims**



6. A staple for use in closing an opening in living tissue, including fascia, said staple, when open, comprising a length of wire having a central portion, and arcuate end portions at opposite ends of the central portion having points at their ends opposite said central portion, with the points on said end portions and said central portion being generally aligned; which staple, when closed, is bent around the juncture between said end portions and said central portion to form the central portion and adjacent parts of said end portions generally into the shape of a single ellipse with the difference between the inner width dimension of the ellipse and the dimension between the points of the open staple being in the range of about 60 to 70 percent of the dimension between the points of the open staple to provide a substantial amount of gather for the living tissue defining the opening, with said end portions in side-by-side crossed relationship at the side of the ellipse opposite said

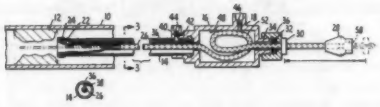
central portion, and with the points on each of the end portions positioned adjacent the juncture between the central portion and the other of the end portions so that each of said end portions of the staple can extend through the tissue on one side of the closed opening and project into the tissue on the other side of the closed opening.

4,526,175

DOUBLE LUMEN DILATATION CATHETER

Albert K. Chin, San Francisco, and Thomas B. Kinney, Mountain View, both of Calif., assignors to Thomas J. Fogarty, Palo Alto, Calif.

Filed Feb. 22, 1983, Ser. No. 468,203
Int. Cl.³ A61M *29/02*
U.S. Cl. 128—344 **3 Claims**



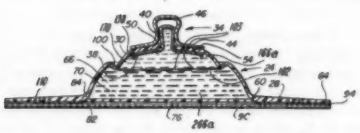
1. A dilatation catheter comprising an elongated flexible tubular outer catheter, a housing having axially aligned distal and proximal openings, said outer catheter having its proximal end attached to said housing in alignment with the distal opening thereof, a dilatation balloon having its distal end in secured relationship to the distal end of said outer catheter, an elongated flexible tubular inner catheter extending along said outer catheter in generally spaced relation thereto and through said housing and the distal and proximal openings thereof, said inner catheter having its distal end attached in sealed communicating relation with the proximal end of said balloon to provide a passage through the balloon, means associated with the proximal opening of said housing to grip the proximal end of said inner catheter when the same has been tensioned to remove the slack from said balloon and inner catheter, said means being selectively operable to grip and ungrip said inner catheter and having an open-ended unobstructed rectilinear throughbore axially aligned with said axially aligned distal and proximal openings to thereby provide said catheter with a permanently open central lumen whereby said dilatation catheter may be readily guided for emplacement by a pre-positioned guide wire, and a radially enlarged chamber defined within the housing between said distal and proximal openings to receive and store a layup loop of said inner catheter when the proximal end thereof is manually fed inwardly of said proximal opening of said housing between successive ungripping and gripping operations of said means to thereby condition said balloon for eversion from said outer catheter.

4,526,176

LONG-LIFE BIOMEDICAL APPLICATION DEVICE, PARTICULARLY ELECTRODE, AND METHOD OF TRANSFERRING ELECTRICAL CURRENT

Roger E. Bremer, Fort Lee; Charles Anthony, Jr., Livingston, and Raymond M. Chappel, Mendham, all of N.J., assignors to Frantz Medical Development Ltd., New York, N.Y.

Filed Dec. 22, 1981, Ser. No. 333,287
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—641 **19 Claims**



1. Long storage life multiple purpose biomedical electrode for use on a subject for transferring electrical current between an external circuit and a body surface of the subject having

a generally inverted dish or cup-shaped housing (**24**) of a deformable material, and defining a chamber (**66**) therein, said housing including a roof (**30**), and a base (**56**) and being formed with an opening at the base:

a hydrophobic microporous, inducible fluid-permeable membrane (**76**) secured to said housing at the base, said membrane covering the opening in said housing and closing the chamber (**66**);

a peelable, releasable fluid-impervious protective cover film (**90**) overlying said membrane;

a liquid-compatible, pressure-sensitive adhesive means (**94**) securing said releasable cover film (**90**) to said base (**56**),

said protective film being selectively removable to expose said membrane and permit attachment of said electrode to a body surface;

electrically conductive terminal means (**34**) sealed to and extending through said roof of said housing and providing electrically conductive communication between the exterior of said housing of said electrode and said chamber (**66**);

and comprising, in accordance with the invention,

means (**101, 102**) for subdividing said chamber into a first chamber portion (**166, 166*a***) and a second chamber portion (**266, 266*a***),

the terminal means (**34**) having an exposed electrically conductive portion (**38, 40**) in said first chamber portion (**166, 166*a***),

said subdividing means (**101, 102**) being of frangible material subject to rupture upon deformation and displacement of a wall of the housing;

tissue-compatible electrolyte means (**70**) for conducting electrical current, substantially filling said second chamber portion (**266, 266*a***), said electrolyte means being separated from said exposed electrically conductive portion (**38, 40**) of the terminal means (**34**) prior to rupture of the subdividing means, and

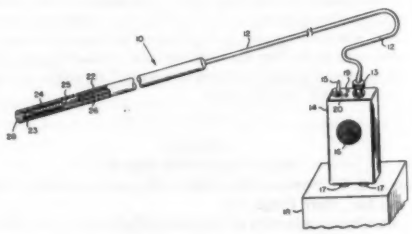
wherein the first chamber portion (**166, 166*a***) retains therein at least one material selected from the group consisting of a surfactant, a skin penetrant, a sweat-inducing agent, and an antibacterial agent.

4,526,177

ELECTRONIC ANATOMICAL PROBE

Michael A. Rudy, 619 French Rd., Rochester, N.Y. 14618, and Joseph Jacob, 42 White Ter., Ramsey, N.J. 07446

Filed Jun. 24, 1983, Ser. No. 507,358
Int. Cl.³ A61B *5/06*
U.S. Cl. 128—737 **20 Claims**



1. An electronic anatomical probe device, comprising

a housing having thereon a manually operable switch movable between ON and OFF positions, respectively,

a solid state, fixed frequency oscillator secured in said housing,

a DC power supply means in said housing for energizing said oscillator when said switch is in its ON position,

a tubular probe having a tip end disposed to be inserted in a wound or the like,

a wire sensing coil sealed in the tip end of said probe,

means connecting said coil to the output of said oscillator, including an elongate, coaxial cable secured at one end in said probe to said coil, and releasably connected at its opposite end to said housing and to the output of said oscillator,

said coil and said connecting means being tuned to the frequency of the output of said oscillator, whereby when energized thereby, the voltage drop across said coil remains constant until the coil approaches a metallic object,

means in said housing for sensing the voltage drop across said coil, and

alarm means connected to said sensing means and operable thereby to provide a warning signal in response to a predetermined change in said voltage drop across said coil.

4,526,178

METHOD FOR OBTAINING LACRIMAL FLUID

Helmut Opel, Hudtwalckerstrasse 2-8, 2000 Hamburg 60, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,256

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3243339

Int. Cl.³ B23B *31/18*

U.S. Cl. 128—760 **13 Claims**

1. A method for obtaining lacrimal fluid comprising contacting a hydrophilic contact lens with a water content of 38% to 85% with a lacrimal fluid, permitting the contact lens to absorb the lacrimal fluid, thereafter treating the contact lens containing the lacrimal fluid for a period of 30 minutes to 2 hours at a temperature of 20° to 24° C. with an extractive solution that has a 0.8% to 4% concentration of salts, at least one of which is sodium chloride, resulting in the extraction of the lacrimal fluid from the contact lens.

4,526,179

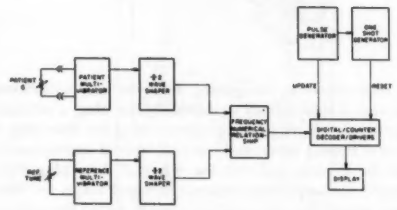
DIGITAL APICAL FORAMEN LOCATING APPARATUS

Leonard Salesky, 41 Polk St., Riverside, N.J. 08075, assignor to Leonard Salesky and Phyllis S. Farber, both of Riverside, N.J.

Filed Jan. 28, 1983, Ser. No. 461,914

Int. Cl.³ A61C *19/04*; A61B *5/05*

U.S. Cl. 128—776 **11 Claims**



1. An apparatus to determine the position of an instrument in a tooth and to display numerically the distance of the apical end of the instrument from the peridontal membrane around the tooth comprising,

(a) a first electrical contact means to provide electrical connection from a circuit to an instrument for penetration into the tooth of a patient,

(b) a second electrical contact means to provide electrical connection from the circuit electrically connecting to an electrical return to the patient,

(c) a first oscillator means in the circuit electrically connected across the first and second contact means, to continuously generate an oscillating wave signal wherein the frequency of the wave signal is dependent upon the conductance between the first and second contact means,

(d) a second oscillator means to continuously generate an oscillating wave signal as a reference signal set to a constant frequency,

(e) an arithmetic frequency measuring and transmitting means to receive the signals from the first and second oscillator means, to determine an arithmetic relationship between the pulse rate of the signal from the first oscillator means and the pulse rate of the signal from the second oscillator means and transmit that arithmetic relationship,

(f) at least one counter means to receive the arithmetic relationship and to determine the count of the value of the arithmetic relationship and transmit a coded signal of the relationship value of that count,

(g) a decoder means to receive the coded signal and convert it to another signal to activate the appropriate sections of a numerical display means,

(h) a register means to receive and hold the coded signal and convey a second coded signal upon receipt of an update interrupt signal,

(i) an update means to cause removal of the information in the register means, after the duration of a pre-set period of time wherein the time period is chosen as directly proportional to a unit of distance of instrument travel in the tooth,

(j) a reset means to cause the counter means to reset to zero and resume counting again immediately after the interruption by the update means, and

(k) a numerical display means to receive the other signal and to display the arithmetic relationship.

4,526,180

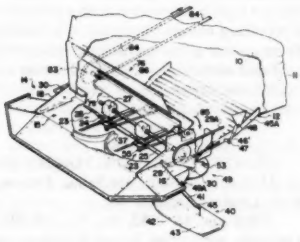
STRAW CHOPPER AND SPREADER ASSEMBLY

William A. Scott, and Bernard Penner, both of Winnipeg, Canada, assignors to Keith Industries Incorporated, Winnipeg, Canada

Filed Aug. 2, 1982, Ser. No. 404,611

Int. Cl.³ A01F *7/00*

U.S. Cl. 130—27 R **11 Claims**



1. A straw chopper and spreader assembly for connection to a rear discharge area of a threshing machine of the type which moves forwardly across a field to be harvested and includes means for feeding harvested straw to the discharge area, the said assembly comprising a casing, means for mounting the casing adjacent the rear discharge area for receiving straw therefrom, first and second flail means in the casing for receiving straw and for chopping same, each flail means being arranged for rotation about a substantially vertical axis in a substantially horizontal plane to discharge said chopped straw, and means for directing the discharge of chopped straw from said casing in a direction outwardly and downwardly of the rear discharge area of said threshing machine to the sides and rear of the machine and including adjustable chute means positioned only at the sides for redirecting the movement of the chopped straw at the sides from said downward and outward direction to an upwardly and outwardly direction.

4,526,181

SELF-PROPELLED HARVESTER THRESHER

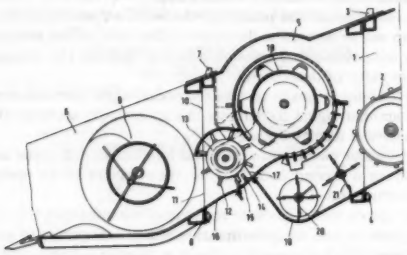
Franz Heidjann, and Johannes Dammann, both of Harswinkel, Fed. Rep. of Germany, assignors to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Oct. 18, 1983, Ser. No. 545,612

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1982, 3239552

Int. Cl.³ A01F *7/04, 11/00*

U.S. Cl. 130—27 R **8 Claims**



1. A self-propelled harvester thresher, comprising a cutting mechanism trough for cutting a product and provided with a through-going opening; an axial threshing and separating mechanism operating in accordance with an axial threshing principle for threshing and separating the cut product; an inclined conveyor for transporting the threshed and separated product and arranged so that said axial threshing and separating mechanism is located between said cutting mechanism trough and said inclined conveyor; at least one introducing drum partially extending through said through-going opening of said cutting mechanism trough and provided for introducing the cut product into said axial threshing and separating mechanism, said introducing drum being formed as a threshing pin drum for rice threshing and being removably mounted to be exchanged; a threshing trough associated with said pin drum and formed as a tight bottom sheet with a plurality of threshing pins, said threshing trough being height adjustable and being removably mounted to be exchanged; means for removable mounting of said introducing drum; and means for removably mounted said threshing trough.

4,526,182

CIGARETTE MAKING MACHINES

Francis A. M. Labbe, Neuilly-sur-Seine, France, assignor to Molins plc, London, England

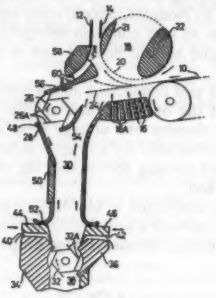
Filed Apr. 16, 1982, Ser. No. 369,026

Claims priority, application United Kingdom, Apr. 16, 1981, 8112184

Int. Cl.³ A24C *5/39*

U.S. Cl. 131—109.1 **17 Claims**

1. A cigarette making machine including an upwardly extending chimney, means for delivering tobacco into the lower end of the chimney, a downwardly extending duct below the chimney through which at least part of the air entering the chimney flows upwardly, and a projector roller disposed downstream of said duct along the direction of delivery of said tobacco, the tobacco delivery means being arranged to project the tobacco in a direction transverse to the chimney, from which direction lighter particles of tobacco are deflected upwards into the chimney by an upwardly flowing air stream while heavier particles of tobacco continue past the lower end of the chimney, across the top of the duct and towards said projector roller which is arranged to project the heavier particles of tobacco downwards at a controlled velocity directly into said downwardly extending duct, the projector roller having outwardly extending tobacco engaging elements around its circumference and being arranged to project the



heavier particles of tobacco along a path which is inclined inwardly towards the center of the duct.

4,526,183

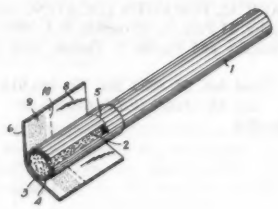
FILTER CIGARETTE

Walter A. Nichols; Reginald W. Newsome, and Willard A. Geiszler, Jr., all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 429,393, Sep. 30, 1982, abandoned. This application Feb. 22, 1984, Ser. No. 582,598

Int. Cl.³ A24D *3/04*

U.S. Cl. 131—336 **7 Claims**



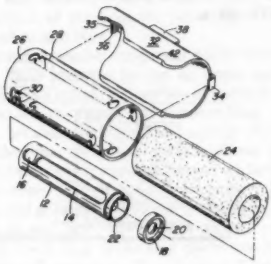
1. A filter cigarette, comprising a substantially cylindrical tobacco rod, a substantially cylindrical filter plug, a substantially air-permeable plug wrap circumscribing the filter plug, a first layer of tipping paper, and a second layer of tipping paper, wherein the tobacco rod and the wrapped filter plug have substantially the same cross-sectional area and shape, the filter plug has a mouth end and a rod end open to permit the passage of air and smoke, the tobacco rod and the wrapped filter plug are axially aligned in abutting, end-to-end relation and circumscribed and joined by the first layer, the first layer extends from the mouth end of the filter plug to a position on the tobacco rod adjacent the rod end of the filter, the first layer is air permeable, the second layer is substantially air impermeable and circumscribes the first layer, the second layer extends substantially from the mouth end to the rod end of the first layer, and the second layer has means for dividing it into a first, mouth-end sleeve attached to the first layer, and a second, rod-end sleeve detachable from the first sleeve for axial movement between the first sleeve and positions along the tobacco rod to expose the underlying air-permeable first layer, thereby varying the amount of air admitted to the filter.

4,526,184

STEAMABLE HAIR CURLER

Richard Caruso, 7801 Montgomery Ave., Elkins Park, Pa. 19117

Filed Feb. 22, 1984, Ser. No. 582,248
Int. Cl.[3] A45D 2/02
U.S. Cl. 132—39 20 Claims



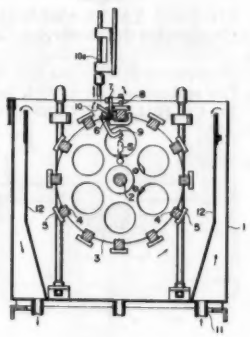
1. A hair curler comprising a first coreless hollow sleeve of flexible foam plastic material closed at one end, a second sleeve surrounding said first sleeve, said second sleeve having spaced longitudinally extending aperture means around its periphery to render the central portion of the second sleeve flexible, the other end of said first sleeve being arranged to receive steam.

4,526,185

HOLDING APPARATUS FOR USE IN CLEANER OR DRYER FOR DUAL PIN TYPE ELECTRONIC PARTS

Yoshinori Fukuda, Osaka, Japan, assignor to Ideya Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 477,666, Mar. 22, 1983,. This application Aug. 3, 1984, Ser. No. 636,808
Claims priority, application Japan, Mar. 23, 1982, 57-46122
Int. Cl.[3] B08B 3/04
U.S. Cl. 134—159 4 Claims



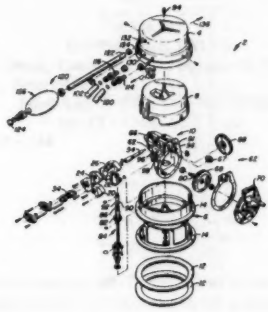
1. A holding apparatus for use in a cleaner or dryer for dual pin type electronic parts, comprising a central shaft mounted in a housing which has an opening at the top, a pair of end plates provided on both ends of said central shaft, at least one rail rod connected between said end plates, a mounting table attached on each of said rail rod for mounting dual pin type electronic parts thereon, and a holding rod mounted at the side of each rail rod for holding the electronic parts on said mounting table and connected to a shaft correlated to a rotating means, said dual pin type electronic parts being loosely held between the mounting table and the holding rod such that a gap is formed between the electronic parts and the mounting table or holding rod due to rotation.

4,526,186

LOW PRESSURE POOL CLEANER

Herman E. Frentzel, Kentfield, Calif., assignor to Arneson Products, Inc., Corte Madera, Calif.

Filed Oct. 12, 1983, Ser. No. 541,193
Int. Cl.[3] B08B 3/02, 9/00; F17D 3/00
U.S. Cl. 134—167 R 10 Claims



1. A low pressure fluid jet pool cleaner comprising:
a buoyant housing;
a drive unit mounted to said housing, said drive unit including:
a drive unit case;
a main fluid inlet;
a fluid reservoir fluidly coupled to said main fluid inlet;
a turbine;
a first fluid path from the fluid reservoir to a turbine inlet at the turbine;
a cleaner hose outlet;
a second fluid path from the fluid reservoir to the cleaner hose outlet;
a drive train operably coupled to said turbine and having at least one power take-off point;
a forward nozzle for directing fluids in a forward direction;
a reverse nozzle for directing fluids in a reverse direction;
a third fluid path from the fluid reservoir to a valve inlet;
fluid valve means, operably coupled to said power take-off point for actuation by said drive train, for alternately fluidly connecting said forward nozzle and said reverse nozzle to said valve inlet; and
said first, second and third fluid paths arranged in parallel with one another;
a fluid supply hose coupled to said main fluid inlet; and
a flexible depending cleaner hose fluidly connected to said hose outlet.

4,526,187

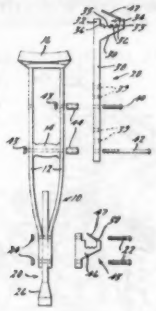
AMBULATION AID HAVING BRACKET FOR ATTACHING ACCESSORY MEDICAL DEVICES

Jerome V. Ciullo, 2831 Baltane, West Bloomfield, Mich. 48033

Filed Sep. 30, 1982, Ser. No. 432,078
Int. Cl.[3] A61H 3/02
U.S. Cl. 135—66 18 Claims

1. A device for attachment to a crutch and from which medical apparatus such as a container for intravenous therapy or a gravity flow drainage device may be suspended, said device comprising upright extension means having an outwardly projecting bracket, said bracket defining a generally U-shaped channel, said channel defining groove means to engage and trap a hanging strap or handle of medical apparatus; movable closure means for bridging the channel to prevent accidental removal of the medical apparatus; and a plurality of spaced attaching means associated with said upright extension means for attaching said device to a crutch, whereby the de-

vice can be attached high on a crutch to safely hold medical apparatus such as an intravenous bottle or the like, or low on a crutch to safely hold medical apparatus such as a gravity



flow drainage device or the like so that a patient can be ambulatory while utilizing the device with the medical apparatus on a crutch.

4,526,188

PROCESS AND APPARATUS FOR MIXING GASES IN A SPECIFIC PROPORTION AND DOSING THE RESULTANT GAS MIXTURE

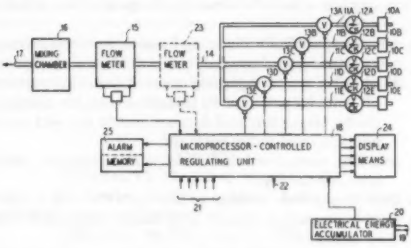
Sven-Gunnar Olsson, Soedra Sandby; Björn Jonson, Lund, and Hanna Neuman, Solna, all of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 12, 1982, Ser. No. 377,464

Claims priority, application Sweden, May 14, 1981, 8103025

Int. Cl.³ G05D *11/13*

U.S. Cl. 137—3 **3 Claims**



1. In a method of mixing a plurality of gases in a specified proportion and dosing the resultant gas mixture to a point of use whereby individual gases are transmitted via separate lines having controllable valve means successive in pulse-like fashion to a common line and the pulse gas quanitites of the various gases behave in relation to one another like the desired proportions between such gases in the mixture, wherein the improvement comprises:

determining the flow of individual gas pulses in one and the same flow meter;

controlling the gas quanitites of the individual gas pulses by regulating the length of such gas pulses in dependence on measured values obtained from said flow meter,

said flow of individual gas pulses being determined by two flow meters which respond differently to specific properties of the gases and any deviation from a predetermined difference in such measurement results is displayed and/or utilized to initiate operative counter-measures.

4,526,189

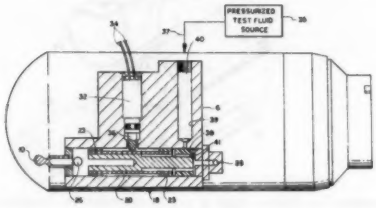
FLUID DELIVERY SYSTEM INCORPORATING ELASTOMERIC CHECK VALVE

Richard D. Scott, Northridge, Calif., assignor to HR Textron Inc., Valencia, Calif.

Continuation-in-part of Ser. No. 512,830, Jul. 11, 1983,. This application Mar. 28, 1984, Ser. No. 594,138

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—68 A **8 Claims**



1. In a fluid delivery system having a chamber for receiving fluid under pressure, a passageway for connecting said chamber to a using apparatus, means defining a first and a second flow path disposed in said passageway and blocking communication between said chamber and said using apparatus and having a fracture area;

means for applying force to said fracture area sufficient to fracture said fracture area and to establish communication between said flow paths, and a test port connected to said passageway downstream of said blocking area, the improvement comprising:

an elastomeric member disposed in said passageway and allowing flow of test gas under pressure in a first direction through said test port and into said using apparatus while blocking flow of gas under pressure in the opposite direction from said passageway and through said test port.

4,526,190

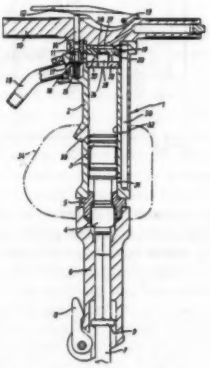
CONTROL VALVE ASSEMBLY

David T. Allan, 9 Broomhill Dr., Rutherglen, Glasgow, Scotland G73 3QH

Continuation-in-part of Ser. No. 241,856, Mar. 9, 1981, abandoned. This application Aug. 9, 1983, Ser. No. 521,605

Int. Cl.³ F01L *25/02*; G05D *11/00*

U.S. Cl. 137—119 **4 Claims**



1. A control valve assembly for a pneumatic reciprocating motor comprising:

(A) a valve block;

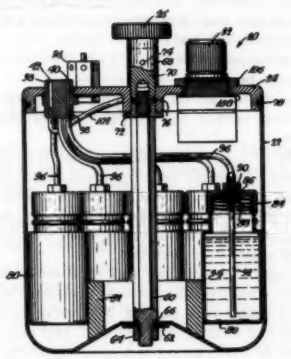
(B) an annular boss depending from said valve block, an inner cylindrical surface of said boss defining a cylindrical bore, said bore having a lower end face and an upper end face;
(C) a first outlet in said valve block communicating with said lower end face of said cylindrical bore;
(D) a second outlet in said valve block communicating with said upper end face of said cylindrical bore;
(E) an inlet in said annular boss communicating with said cylindrical surface of the boss for providing a supply of pneumatic fluid to said bore;
(F) a cylindrical valve member reciprocal within said cylindrical bore, the valve member having an upper end face, a lower end face and a cylindrical surface of uniform diameter throughout the length of the valve member; and
(G) a clearance between the cylindrical surface of the valve member and the inner cylindrical surface of said bore;
(H) said valve member being movable between a first position in which said upper face of the valve member closes said second outlet and permits flow of pneumatic fluid from the inlet directly to said first outlet and a second position in which the said lower face of the slug closes said first outlet and allows flow of pneumatic fluid from said inlet to said second outlet only through said clearance between the cylindrical surface of the valve member and the inner cylindrical surface of said bore.

4,526,191

FLUID SUPPLY CONTAINER FOR COLOR CHANGER

Edward A. Pomponi, Jr., Boulder, Colo., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed Aug. 30, 1983, Ser. No. 527,862
Int. Cl.³ B67D *5/52*
U.S. Cl. 137—206 **15 Claims**



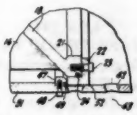
1. A container for holding a plurality of bottles of fluid of different colors and having vented caps and fluid outlets in the caps, and for providing the fluids under pressure at an outlet from said container, said container comprising a canister; bottle retaining means in said canister for receiving and holding the plurality of the bottles of fluid; a removable cover mounted on and closing said canister in sealed relationship therewith; an outlet connector extending through one of said canister and cover and having a plurality of fluid conveying passages therethrough; a plurality of flexible conduit means each connectable between an associates one of the bottle cap fluid outlets and a respective one of said fluid conveying passages; and means for introducing pressurized air into said canister to deveop a positive pressure of air therein and in all of the bottles through the vents thereof to force the fluids in the bottles through the fluid outlets in the caps and through said plurality of conduit means to said outlet connector fluid conveying passages, whereby said fluid conveying passages each receive fluid from an associated one of said bottles.

4,526,192

DISCHARGE VALVE

Robert W. Dixon, Concord, Calif., assignor to Chas. M. Bailey Co., Inc., Emeryville, Calif.

Filed Aug. 5, 1983, Ser. No. 520,650
Int. Cl.³ F16K *3/26, 3/32*
U.S. Cl. 137—244 **4 Claims**



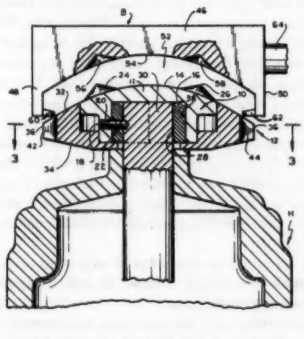
1. A submersible discharge valve comprising a body symmetrical about a main axis and having an inlet on said main axis, a coaxial circular seat, means for mounting said seat on the end of said body, means defining a radial outlet opening in said body between said inlet and said seat, a coaxial polyjet sleeve mounted to slide over said seat and on said body, said sleeve being perforated with a plurality of radial flow holes, each of said flow holes having a radial axis and being spaced axially from others of said flow holes, means for moving said sleeve axially relative to said body to establish communication between a selected number of said flow holes and said opening, packing means on said sleeve in sliding engagement with said body, and a peripheral bearing ring removably mounted on said circular seat and in sliding engagement with the interior of said sleeve and across said flow holes.

4,526,193

SECURITY CAP ASSEMBLY AND ACTUATOR

Edward Drach, 4390 Richardson Ave., Bronx, N.Y. 10466

Filed Aug. 22, 1984, Ser. No. 643,166
Int. Cl.³ F16K *35/06;* **E03B** *9/06, 9/14*
U.S. Cl. 137—296 **16 Claims**



1. Cap assembly for a valve or the like comprising a substantially disc-shaped inner member adapted to be mounted on the valve stem and comprising means for engaging the valve stem and an exterior surface, said exterior surface being substantially uninterrupted except for substantially conical means project-

ing therefrom, an annular outer member substantially freely rotatably mounted about said inner member, said outer member having upper and lower surfaces and a peripheral slot, said inner member being mounted within and substantially abutting said outer member such that said exterior surface of said inner member and said upper surface of said outer member forms a substantially continuous arcuate surface except for said conical means projecting there from which receives a special tool means for turning said valve stem through said peripheral slot.

4,526,194

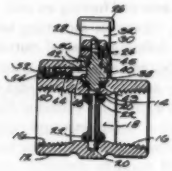
TAMPER-PROOF VALVE

Frank J. Miller, Muskego, Wis., assignor to Milwaukee Valve Company, Milwaukee, Wis.

Continuation of Ser. No. 252,160, Apr. 8, 1981,. This application Oct. 7, 1983, Ser. No. 540,099

Int. Cl.³ F16K *35/00*

U.S. Cl. 137—385 **12 Claims**



1. A valve comprising

a body having a flow passage extending therethrough;

a stem rotatably mounted in said body;

a valve member supported on said stem and disposed in said flow passage for rotatable movement through 90° between open and closed positions;

operating means connected to said stem and movable by an operator to rotate said valve member between the open and closed positions; and

a locking mechanism mounted in the interior of said body and cooperating with said stem for permitting an operator, by moving said operating means without axial displacement of said stem and without moving any other separate part of said valve, to rotate said valve member 90° in a first direction from a starting position to a locked position, which is either the closed position or the open position depending on the starting position and for preventing subsequent rotation of said valve member after an initial rotation of 90° from the starting position, either in a second direction opposite to said first direction or in said first direction from the locked position back to the starting position, said locking mechanism including a cam having a camming surface including a detent notch situated at a location corresponding to the locked position of said valve member,

a plunger mounted on the other of said stem and said body for slidable movement relative to and engagement with said camming surface, and

means for urging said plunger into engagement with said camming surface, whereby said plunger rides against said camming surface during rotation of said valve member from the starting position toward the locked position in the first direction and is urged into said detent notch when said valve member reaches the locked position.

4,526,195

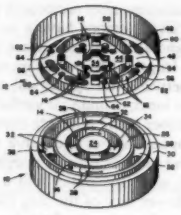
REINFORCED PLASTIC STRUCTURE SUCH AS A VALVE

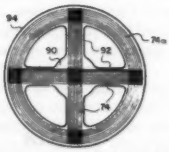
Frederick H. Humphrey, and Brock H. Humphrey, both of Markham, Canada, assignors to IIC Mechanical Products Limited, Dowsview, Canada

Continuation-in-part of Ser. No. 207,931, Nov. 18, 1980, abandoned. This application Jun. 27, 1983, Ser. No. 508,282

Int. Cl.³ F16K *15/00*

U.S. Cl. 137—512.1 **11 Claims**





1. A valve structure of the type comprising a valve seating member defining a plurality of valve openings therethrough, and valve closure means, and a spring bearing member, and a spring means supported thereby for controlling said valve closure means, said seating member comprising a single homogeneous structure defining:

an outer body portion;

a center core portion;

seating means formed on said outer body portion and said center core portion for reception of said closure means thereon;

a plurality of groups of unidirectional reinforcing fibres extending on a linear path from said center core portion into said outer body, being embedded in and completely surrounded by a mouldable plastic resin material and defining reinforced arms joining said outer body portion and said center core portion;

valve openings having sides and ends and formed in said structure with said sides between said outer body portion and said center core portion, said valve openings lying between and terminating with each said end adjacent to but clear of a said group of reinforcing fibres;

and said spring bearing member comprising;

an outer ring portion;

a center bearing portion located spaced inwardly therefrom;

a plurality of groups of reinforcing fibres extending on a linear path from said center bearing portion into said outer ring portion and being embedded in and completely surrounded by a mouldable plastic resin material and defining reinforced arms joining said outer ring portion with said center bearing portion;

a plurality of flow passageways having sides and ends and located with said sides between said center bearing portion and said outer ring portion said flow passageways lying between and terminating with each end adjacent to but clear of a said group of reinforcing fibres;

a plurality of spring housing blocks formed with spring

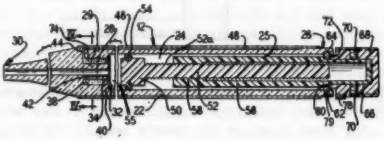
recesses therein for reception of spring means, said blocks being supported between said outer ring portion and said center bearing portion, and supporting spring means in registration with said valve closure means, said blocks being located in offset relation to said groups of fibres of said spring bearing member whereby said spring receiving recesses do not intersect said fibres in said arms.

4,526,196

GAS PRESSURE MEASURING AND REGULATING DEVICE AND METHOD

John Pistillo, Cleveland, Ohio, assignor to Nayan S. Shah, Mentor, Ohio

Filed Jan. 26, 1983, Ser. No. 461,267
Int. Cl.³ F16K *37/00*; A61M *15/08*
U.S. Cl. 137—557 **22 Claims**



1. A device for measuring and regulating the gas pressure in an enclosure, comprising:

pressure responsive means including a visual pressure indicator and having a coupling terminal;

a duct communicating with said enclosure and having an adaptor provided with a one-way self-closing valve and adapted to receive said coupling terminal for effecting pressure communication between said pressure responsive means and said enclosure through said duct; and

a hollow elongate connector adapted to be replaceably coupled at one end to said coupling terminal and at its opposite end to said adaptor, and an inlet opening into said connector intermediate said ends and having a one-way self-closing check valve adapted to be opened by a gas pressure source means inserted into said inlet and to close the inlet when the gas pressure source means is removed.

4,526,197

PNEUMATIC VALVE

John C. Martin, and Paul Martin, both of Toronto, Canada, assignors to Diesel Equipment Limited, Toronto, Canada

Filed Jan. 10, 1984, Ser. No. 569,654
Int. Cl.³ F15B *13/04*
U.S. Cl. 137—596.2 **7 Claims**

1. A pneumatic valve comprising:

(a) a housing having a cylinder formed therein,

(b) a valve actuator for opening and closing the valve, said valve actuator comprising a slide member slidably mounted in said cylinder for movement in a path which extends longitudinally of the cylinder between a first position and a second position,

(c) an air inlet passage opening into said cylinder,

(d) an air outlet passage opening from said cylinder,

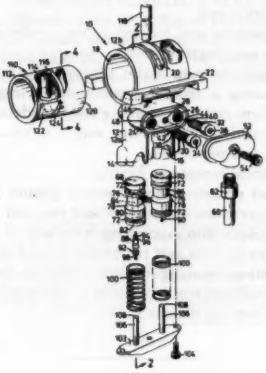
(e) a vent passage opening from said cylinder,

(f) a first flow control valve in said inlet passage which is operable to close to prevent and open to permit the passage of air from the inlet passage to the cylinder,

(g) a second flow control valve in said vent passage which is operable to close to prevent and open to permit the passage of air from said cylinder to said vent passage thereby to vent said outlet passage,

(h) said slide member being adapted to locate the first flow control valve in its closed position and the second flow control valve in its open position when in said first position and to locate said first flow control valve in its open position and said second flow control valve in its closed position when in said second position,

(i) said first and second flow control valves each having a valve stem slidably mounted thereon which is movable between a first position closing and a second position opening said flow control valve, and means normally urging said stem to said first position, the valve stem of the



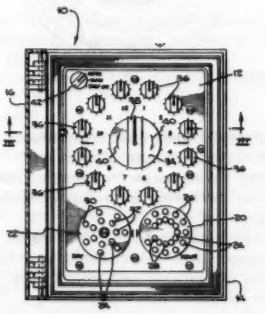
second flow control valve being arranged to project into said cylinder in the direction of movement of said slide member and wherein stop means is supported by said housing in said path of travel of the slide member for arresting movement of the valve stem as said slide member moves toward said first position while permitting continued movement of the slide member to its first position to fully open said second flow control valve as aforesaid.

4,526,198

IRRIGATION CONTROLLER

Loren W. Scott, Redlands, Calif., assignor to The Toro Company, Minneapolis, Minn.

Filed Oct. 20, 1983, Ser. No. 543,952
Int. Cl.³ A01G *27/00*
U.S. Cl. 137—624.2 **27 Claims**



1. An irrigation controller for use with a plurality of electrically or hydraulically activated valves for automatically regulating the time, location, and duration of irrigation comprising, in combination:

a rotary means for sequentially activating said valves;

an indexing means for moving said rotary means having adjustable timing unit means for determining dwell time on each valve;

an hour timer means for determining the time of day for activating said indexing means;

a day timer means for determining the day for activating said indexing means;

wherein each of said hour and day timer means further comprises a cylindrical selector pin and receptacle;

said selector pin having:

a first predetermined diameter;

an insertion end;

an adjustment end located a first predetermined length from said insertion end;

first walls defining a slot through the axis of said pin beginning a second predetermined length from said insertion end and ending a third predetermined length from said adjustment end; and

at least two pin detents;

said clindrical receptacle having:

a second predetermined diameter greater than said first predetermined diameter of said pin; and

a pin detent stop combining with said at least two pin detents to hold said pin at any of said at least two pin detents and making removal of said pin from said receptacle difficult and movement of said pin between said at least two pin detents easy.

4,526,199

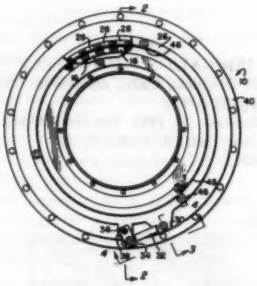
VALVE FOR THROTTLING FLUID

Arnold M. Heitmann, Swampscott, Mass., assignor to Northern Research & Engineering Corp., Woburn, Mass.

Filed Nov. 14, 1983, Ser. No. 551,409

Int. Cl.³ F16K *11/07, 3/26*

U.S. Cl. 137—625.31 **14 Claims**



1. A valve for throttling fluid, comprising:

first means defining an annular chamber;

said chamber having means for admitting fluid thereinto;

said chamber also having means for discharging fluid therefrom; and

second means, coupled to said first means, for throttling fluid discharge from said chamber; wherein

at least one of said first and second means is selectively movable relative to the other thereof;

said discharging means and said second means each have apertures which, responsive to movement of said one means relative to said other thereof, come into and out of a common, aligned registry;

said apertures comprise means for subdividing fluid, discharged from said chamber, into a plurality of fluid jets;

said chamber comprises a pair of substantially concentric walls; and

one of said walls has given ones of said apertures, of said discharging means, formed therein.

4,526,200

BLOCKING VALVE FOR LIQUIDS

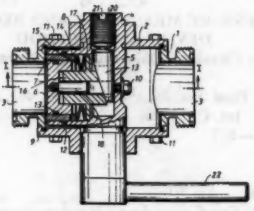
Erkki Niskanen, Helsinki, Finland, assignor to Erkki Niskanen Oy, Helsinki, Finland

Filed Oct. 16, 1984, Ser. No. 661,312

Claims priority, application Finland, Oct. 17, 1983, 833776

Int. Cl.³ F16K *11/08*

U.S. Cl. 137—625.47 **5 Claims**



1. Blocking valve for liquids, which valve comprises a body (1), which forms a cylindrical valve housing (2) that is provided with flow openings (3), and a spindle (4) turnably mounted in the valve housing, the said spindle being turnable between a blocking position covering the flow opening in the valve housing and an open position liberating the flow opening, and the said spindle comprising a stationary body part (5) and a blocking part (6), characterized in that the body part (5) substantially surrounds the central blocking part (6), fitted stationary relative the body part, from the side of the valve housing (2), that the seal (7) for sealing the valve housing (2) relative the flow opening (3) is fitted between the stationary body part (5) and the stationary blocking part (6), and that the pressure at the seal (7) can be adjusted in a way in itself known.

4,526,201

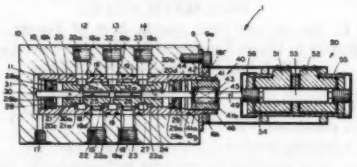
FOUR-WAY VALVE WITH INTERNAL PILOT

Arthur H. Geyler, Jr., and Ted L. Teach, both of Dayton, Ohio, assignors to Spectra-Physics, Inc., Mountain View, Calif.

Filed Nov. 4, 1982, Ser. No. 439,057

Int. Cl.³ F15B *13/043*

U.S. Cl. 137—625.63 **4 Claims**



1. A valve for selectively connecting the inlet and outlet of a fluid pressure source to a fluid pressure chamber incorporating a fluid pressure responsive piston, comprising, in combination: a hollow housing having an axially spaced pair of first radial ports connectable respectively to said fluid pressure chamber on opposite sides of said piston, an axially spaced pair of second radial ports connectable respectively with said inlet and outlet of the fluid pressure source; said first ports being respectively axially adjacent said second ports; a valve spool axially slidable in the bore of said hollow housing; said valve spool having axially spaced external seal elements cooperable with said housing bore and recessed external surfaces intermediate said external seal elements, whereby in a neutral axial position of said spool no fluid flow occurs, in one axial position of said spool away from said neutral position pressurized fluid flows through said pair of first ports in one direction, and in a second axial position of said spool in the opposite direction from said neutral position the flow of pressurized fluid through

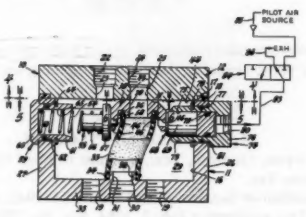
said pair of first ports is reversed; said valve spool having an axial bore and radial ports connecting said valve spool bore with said recessed external surfaces, a pilot spool axially shiftably mounted in said valve spool bore; external sealing means on said pilot spool respectively sealing each of said radial ports in a neutral position of said pilot spool relative to said valve spool; a pair of axially extending passages respectively extending from a region intermediate said external sealing means on said pilot spool to an axial end region of said hollow housing; and adjustable means for axially shifting said pilot valve a predetermined distance in either direction from its said neutral position, said adjustable means including a solenoid core secured to said pilot spool, a first solenoid coil axially spaced from a second solenoid coil, said first and second solenoid coils cooperable with said solenoid core to respectively shift said solenoid core in opposite directions upon respective energization of said solenoid coils, a first threadably adjustable stop means associated with said first solenoid coil for limiting the axial movement of said solenoid core and said pilot spool in one direction when said first solenoid coil is energized and a second threadably adjustable stop means associated with said second solenoid coil for limiting the axial movement of said solenoid core and said pilot spool in an opposite direction when said second solenoid is energized; whereby said valve spool shifts the same amount and direction as said pilot spool to restore the neutral position of said pilot spool relative to said valve spool and establish a flow rate thru said housing ports that is a function of said axial shifting distance of said pilot valve.

4,526,202

VALVE WITH STRAIGHT THROUGH FLOW

William J. Chorkey, 34300 Lyncroft, Farmington, Mich. 48024

Filed May 4, 1983, Ser. No. 491,271
Int. Cl.³ F16K *11/02, 31/122*
U.S. Cl. 137—625.66 **21 Claims**



1. A reversing fluid directional control valve, characterized in that it includes:

(a) a valve body having an enclosed exhaust chamber therein and at least two oppositely disposed sides;

(b) outlet port means formed through one of said sides of said valve body and communicating with said exhaust chamber;

(c) a fixed inlet port means formed through the other of said two sides of said valve body, and communicating with said exhaust chamber;

(d) an exhaust port means in the valve body and connecting said exhaust chamber to the exterior of the valve body;

(e) a conduit valve means disposed in said chamber and having two ends, with one end being operatively connected to the inner end of said inlet port means and the other end being movable to a first operating position and to a second operating position, for selectively directing pressurized fluid entering said inlet port means to said outlet port means in a straight through flow path, and wherein, the end of said straight through flow path at the movable end of the conduit valve means is co-axial with the outlet port means when the conduit valve means is in said first and second operating positions, and fluid entering said outlet port means flows through said exhaust chamber and out the exhaust port means; and,

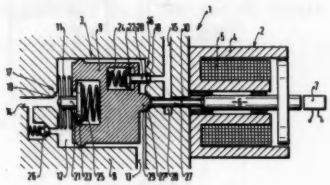
(f) operator means for moving said conduit valve means movable end to said first operating position and to said second operating position..

4,526,203

ELECTROMAGNETIC VALVE

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,306
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1981, 3122747
Int. Cl.³ F16K *31/10*
U.S. Cl. 137—627.5 **5 Claims**



1. An electromagnetic valve comprising a housing means having a plurality of chambers, a reciprocating armature means housed in a first one of said chambers that is isolated from a pressure medium, and a valve means housed in a second one of said chambers in communication with a fluid pressure medium source via a plurality of conduits in said housing means which includes said second chamber, said valve means including a carrier member movable within said second chamber by said armature means via an actuating push rod that extends from said first chamber into said second chamber between said armature means and said carrier means, a plurality of valve elements carried on said carrier member for controlling pressure medium flow through respective aligned conduits, at least two of said valve elements each having a biasing means urging the valve element toward the conduit with which it is in alignment.

4,526,204

CONTROL APPARATUS FOR HYDRAULIC VALVE

Richard D. Primdahl, Gurnee, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 17, 1932, Ser. No. 378,666
Int. Cl.³ F16K *31/60, 31/52*
U.S. Cl. 137—637 **4 Claims**

1. Control apparatus for manually operating a plurality of hydraulic control valves having manual operators comprising:

a base plate;

a control lever mounted to said base plate by spherical pivot means and projecting generally perpendicularly thereto on one side to a first end having a handhold and on the other side to a control end;

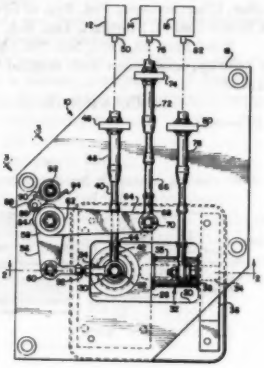
a first control cable having one end pivotally connected to said control end of said control lever and the other end operatively connected to a first hydraulic control valve operator;

an adjustable link pivotally connected to said control end of said control lever and extending in a direction substantially perpendicularly to said first control cable;

a bellcrank pivotally mounted to said base plate about an axis parallel to said control lever and having a first leg perpendicular to said link and pivotally connected thereto and having a second leg disposed perpendicularly to said first leg;

a second cable means pivotally connected to said second

bellcrank leg and disposed perpendicularly thereto and extending substantially parallel to said first cable to a second hydraulic control valve operator, the lengths of said first and second cable and said link being so adjusted to maintain the relative parallelism and perpendicularity such that small movements of said control lever in a direction parallel to said first cable will actuate said first hydraulic control valve without actuating said second hydraulic control valve and small movements of said control lever in a direction parallel to said link will actuate said second hydraulic control valve without actuating said first hydraulic control valve, said control lever further having a position wherein both valves are simultaneously actuated.



4,526,205

PULSATION ABSORPTION DEVICE FOR HIGH PRESSURE LIQUID

Kazuo Sugimura, and Nobuyuki Sugimura, both of 308, Mabase, Shimizu-shi, Shizuoka-ken, Japan

Filed Oct. 18, 1979, Ser. No. 86,663
Int. Cl.³ F16L *55/04*
U.S. Cl. 138—30 **12 Claims**

1. A pulse absorption device comprising:

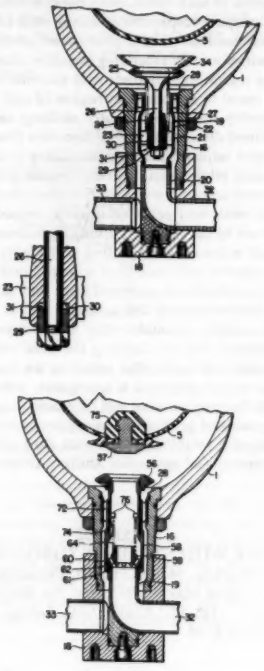
a pressure vessel;

a gas filled bladder housed within said vessel;

an inlet conduit connected to said vessel and communicating with the interior thereof;

an outlet conduit connected to said vessel surrounding said inlet conduit forming an annular outlet in cooperation with said inlet conduit;

valve means to open and close said conduits in response to contraction and expansion of said bladder; and



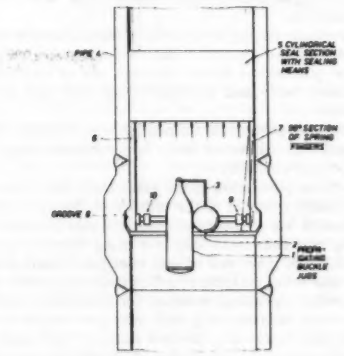
dampening means connected to said valve means to dampen said valve means against sudden opening and closing.

4,526,206

ACTIVATING MECHANISM

Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 391,637, Jun. 24, 1982, abandoned.
This application Feb. 3, 1984, Ser. No. 576,594
Int. Cl.³ F16L *1/04*
U.S. Cl. 138—89 **7 Claims**



1. An activating mechanism comprising a partially buckled closed vessel susceptible to substantially buckling into a flat-

tened configuration only beginning after pressure increases to a preselected magnitude, and connecting means adapted to be drawn toward said vessel as said substantially buckling occurs, whereupon the drawing motion by said connecting means functions to activate an associated mechanism, the associated mechanism being a means for releasing a pipeline plug.

4,526,207

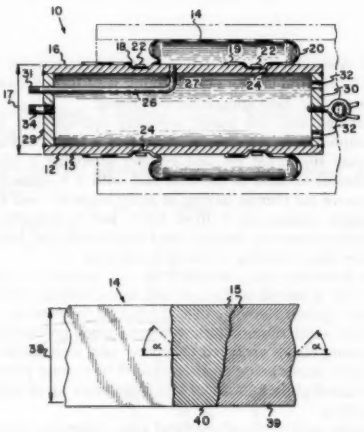
INFLATABLE PLUG FOR INTERIORLY CYLINDRICAL CONDUITS

Thomas E. Burkley, Akron, and Harry T. Kifor, Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 210,908, Nov. 28, 1980, abandoned. This application Feb. 15, 1983, Ser. No. 466,597

Int. Cl.³ F16L *55/12*

U.S. Cl. 138—93 **2 Claims**



1. An inflatable plug for a conduit comprising, in combination:

a rigid, substantially cylindrical mandrel having an outer surface defining a mandrel diameter, an interior chamber, and a fluid passageway in communication with said interior chamber;

an elastomeric tubular sleeve, having a first end portion, positioned on said mandrel, said elastomeric tubular sleeve being inflatably expandable to sealingly engage said conduit, said elastomeric tubular sleeve including reinforcements therein extending in opposite sense helical paths, said elastomeric tubular sleeve having a relaxed diameter in an uninflated state less than said mandrel diameter, whereby said elastomeric tubular sleeve closely conforms to said rigid, substantially cylindrical mandrel in said uninflated state so as to facilitate insertion of said inflatable plug into said conduit;

clamp means for sealingly securing said elastromeric tubular sleeve to said rigid, substantially cylindrical mandrel in a predetermined manner at a first and second circumferential engagement, said fluid passageway interposing said first and second circumferential engagements, said first end portion of said elastomeric tubular sleeve being folded over and into said elastomeric tubular sleeve so as to extend to said first circumferential engagement and so as to form a loop region in said elastomeric tubular sleeve, said loop region extending away from said fluid passageway and substantially beyond said first circumferential engagement so as to substantially increase the longitudinal extent and expandability of said elastomeric tubular sleeve; and

means for admitting and exhausting pressurized fluid between said elastomeric tubular sleeve and said rigid, substantially cylindrical mandrel through said fluid passageway.

4,526,208

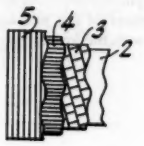
TILE-LINED PIPE WITH SUBDIVIDED TILES THEREIN AND METHODS OF PRODUCTION THEREOF

Fred E. Klimpl, Great Neck, N.Y., assignor to Koch Engineering Co., Inc., Wichita, Kans.

Division of Ser. No. 428,176, Sep. 29, 1982, Pat. No. 4,484,969. This application Sep. 1, 1983, Ser. No. 528,612

Int. Cl.³ F16L *9/10, 9/16*

U.S. Cl. 138—144 **6 Claims**



1. A pipe to convey a fluid having particles therein, said pipe comprising a tubular pipe membe of fiberglass and resin impregnating said fiberglass, said pipe member having inner and outer surfaces, a layer including ceramic tile elements and a tape supporting said elements proximate said innter surface to form a lining thereat, said tile elements extending one after another along helical lines, each tile element having at least one face adjoining the face of an adjacent tile element having at least one face adjoining the face of an adjacent tile element, said adjoining faces being formed by breakage of a tile whereby said faces closely conform to one another, and said resin integrating the tiles with the pipe member, the said resin having a modulus of elasticity and resilience to constitute a shock absorbing means to resist impact forces generated by said particles, said tiles having a hard smooth surface to minimize resistance to said particles, and an innter layer on said tiles and adapted for being worn away by said fluid with the particles therein, the edges of tile elements in adjacent rows being offset whereby to avoid continuous lines which favor deterioration by abrasion.

4,526,209

CARPET LOOM

Roy E. Pharr, Stoneville, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

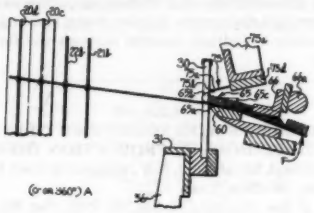
Filed Jan. 11, 1984, Ser. No. 569,846

Int. Cl.³ D03D *39/20*

U.S. Cl. 139—46 **5 Claims**

1. In a loom of the type having a group of elongate warpwise extending pile wires for the formation of pile loops thereover, said pile wires having upstanding rear portions terminating adjacent the fell of the fabric being woven, knives positioned forwardly of said upstanding rear portions of said pile wires for cutting the loops of pile yarns positioned over the pile wires, shed forming means for shedding base warp yarns in forming the backing of the pile fabric and for shedding the pile yarns, pattern means operatively associated with said shed forming means for selecting certain of the pile yarns for forming the desired pile fabric pattern, and a group of transfer hooks for engaging the selected pile yarns and for transferring the same over and across the pile wires for forming pile loops, the combination therewith of means mounting said group of pile wires

for unitary pivotal movement about an axis extending weftwise of the loom forwardly of said upstanding rear portions of the pile wires so that the pile wires may be pivotally moved downwardly by the tension in the pile yarns looped thereover for



moving the pile wires into engagement with and to rest upon the base fabric being woven to thereby assure obtaining the desired height of pile loops during weaving and to permit the unimpeded movement of the pile loops along the pile wires into engagement with the knives.

4,526,210

EASILY REPLACEABLE WEAVING MECHANISM NEEDLE ASSEMBLY

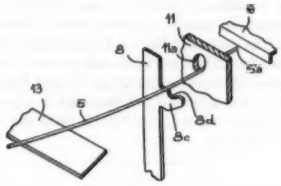
Ulrich Mutschler, Caluire; Pierre Caparros, Couzon au Mont D'or; Pierre Mouterde, Chatillon sur Chalaronne, and Pierre Frappe, Lyons, all of France, assignors to Staubli-Versol S.A.R.L., Chassieu, France

Filed Jul. 22, 1983, Ser. No. 516,062

Claims priority, application France, Jul. 23, 1982, 82 13222

Int. Cl.³ D03C *3/00*

U.S. Cl. 139—59 **4 Claims**



1. Weaving mechanism of the Verdol type of which the needles controlling the press of the hooks are made in one piece and pass through vertical guide plates, characterized in that it comprises:

a grid whose inclined bars (13) constitute deflectors intended to bend the needles (5) upwardly;

flat small needles (8) each comprising a lateral lug (8*c*) adapted to cooperate with the corresponding needle (5) and which are extended by a fine tail (8*b*) of which the attachment to the small needle forms a shoulder (8*a*);

a perforated panel (12) which the tails (8*b*) of the small needles (8) traverse, their shoulders (8*a*) resting against said panel (12);

a plate (11) for guiding the needles (5) which are in abutment against the lower part of its perforations (11*a*);

and a mechanism (15) for driving the paper (9) and which is provided with means for displacing it in reciprocating motion in the vertical direction.

4,526,211

FABRIC SELVAGE END CUT PREVENTION CUTTER GUIDE

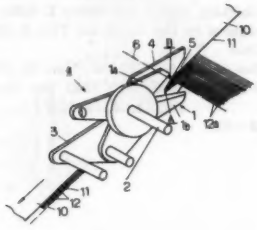
Norimitsu Suso, Konan, Japan, assignor to Shikishima Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 24, 1983, Ser. No. 526,068

Claims priority, application Japan, Aug. 24, 1982, 57-128365[U]

Int. Cl.³ D03D *47/40*

U.S. Cl. 139—430 **3 Claims**



1. A fabric selvage end cut prevention apparatus for a shuttleless loom producing a fabric having weft threads extending from a selvage, said apparatus comprising:

a selvage end cut guide assembly including a bracket adapted to be attached to said loom, a fabric selvage end guide supported on said bracket including a plate-like member formed at its front end with a V-shaped guide groove cut therein having an acute angle tip, and a cutter means comprising a fixed blade and a movable blade mounted on said bracket, said fixed blade and said movable blade forming a cutting point; and

said assembly being attached to said loom at a position where a lateral surface of said fabric selvage end guide rests against a selvage of said fabric at the predicted minimum width of said fabric with said guide groove and said cutting blades arranged to receive said weft threads, said cutter means being positioned with its cutting point close to and slightly forward of said acute angle tip of said guide groove,

whereby said fabric selvage end guide maintains said fabric selvage at a uniform distance from said cutting point so that regardless of any increase in fabric width said weft threads are trimmed to a uniformly short fringe and said selvage is separated from said cutting blades to prevent cutting of said selvage.

4,526,212

ACTUATING DEVICE FOR RECIPROCATING GRIPPERS IN SHUTTLELESS LOOMS

Mazzino Mazzini, Agliana, Italy, assignor to Alamak SA, Luxembourg, Luxembourg

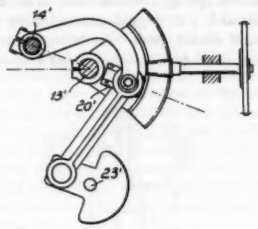
Continuation-in-part of Ser. No. 139,497, Apr. 11, 1980, Pat. No. 4,338,974. This application May 21, 1982, Ser. No. 380,803

Int. Cl.³ D03D *47/00*

U.S. Cl. 139—449 **1 Claim**

1. An actuating device for reciprocating weft thread insertion grippers of a shuttleless loom, comprising a rocker arm having articulation means on one end thereof and pivot means on the other end thereof, a crank at a distance from said articulation means and driven by a cyclic shaft of the shuttleless loom, a connecting rod having one extremity thereof in articulation engagement with said articulation means and having another extremity thereof hingedly connected with said crank, an oscillating gear sector member having shaft means for pivotally supporting it and defining an axis of oscillation thereof, said gear sector having a radial line, a single raceway on said gear sector member and extending along said radial line, a runner movable within said single raceway, linkage means for

hingedly connecting said runner with said one extremity of connecting rod and said articulation means of said rocker arm and a transmission system for converting the oscillating motion



of said gear sector member into the reciprocating motion of said thread insertion grippers, wherein said shaft means of said sector member are arranged in a position intermediate said articulation means and said pivot means.

4,526,213

WEIGHING DIVIDING MACHINES

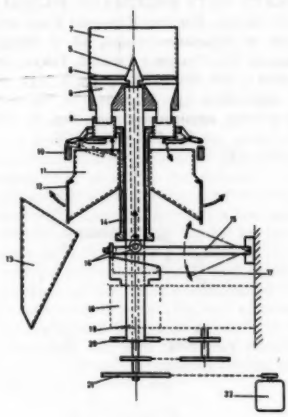
Federico Martinez, 6, Alfonso XIII, St., Parets del Valles (Barcelona), Spain

Filed Jun. 30, 1983, Ser. No. 509,425

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 3225892

Int. Cl.³ B65B *1/10*

U.S. Cl. 141—18 **13 Claims**



1. Apparatus for dividing freeflowing particulate matter into aliquots of closely equal weight comprising:

(A) a weighing receiver for receiving freeflowing particulate matter, said weighing receiver including means for determining when a predetermined weight of the matter has been received therein and means for then discharging the predetermined weight of said received matter; and

(B) a volumetric dividing receiver for receiving the matter discharged from said weighing receiver, said dividing receiver including a plurality of aliquot receivers of identical effective volumetric capacity, means for distributing on a volumetric basis the matter received by said dividing receiver into said aliquot receivers, and means for discharging the latter from said aliquot receivers.

4,526,214

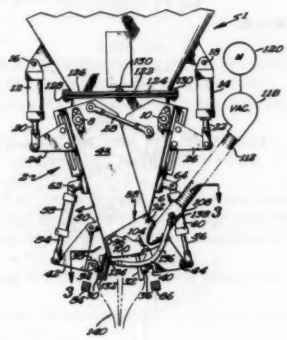
BAG FILLING APPARATUS

Harold R. McGregor, 1444 Lincoln Ave., SE., Owatonna, Minn. 55060

Filed Jul. 29, 1983, Ser. No. 518,395

Int. Cl.³ B65B *1/28*

U.S. Cl. 141—59 **18 Claims**



1. Apparatus for filling bags comprising:

hopper means for containing particulate material to be discharged into bags;

a spout positioned to receive particulate material from said hopper, said spout having a discharge end defined by closure members movable between open and closed positions for the controlled discharge of particulate material into bags hung on said spout wherein said spout closure members comprise a pair of rigid closure devices on the bottom end of said spout movable between a closed position wherein they are in closing contact with each other and an open position wherein they are spaced apart;

clamp means on said spout for releasably holding opposed faces of the mouth of a bag on said spout discharge end wherein said clamp means comprises a pair of clamping members mechanically movable inwardly and outwardly towards and away from said spout closure devices for selective clamping engagement of the top ends of the opposite faces of a bag therebetween, with the opposite faces of the bag held against the outside of said pair of spout closure devices by respective ones of said pair of clamping members, whereby said spout closure devices will be aligned with the interior of a bag hung on the spout;

a dust collector on at least one side of said spout discharge end having a collection port so location as to be in direct, overlying relation to the top end of one side wall of a bag hung on said spout, with said port in fluid flow communication with the interior space of a bag immediately inside of said one side wall thereof;

a generally tubular liner made of flexible material suspended inside of said spout in confining relation to the interior of said discharge end and said movable closure members, said liner having an upper receiving end communicating with said hopper and an open discharge end adjacent the discharge end of said spout, whereby said liner is so constructed and arranged as to confine particulate material discharging from said hopper and prevent the escape of dust to the surrounding atmosphere even when said movable closure members are open; and

conduit means connected to said port for fluid flow communication with a vacuum source.

4,526,215

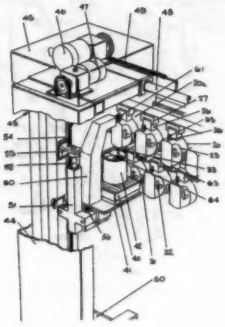
APPARATUS FOR FORMING MIXTURES OF FLUIDS

William J. Harrison, 125, High St., Bottisham, Cambridgeshire; Andrew J. Reynolds, 10, Mill Hill End, Hilton, Huntingdon; Michael J. Kellaway, 127 Layston Park; Donald B. A. MacMichael, 17, Green St., both of Royston, Hertfordshire, and Anne T. Miller, 7 North Cottages, Trumpington Rd., Cambridge, all of England

Filed Jul. 14, 1983, Ser. No. 513,415

Int. Cl.³ B65B *1/32*

U.S. Cl. 141—83 **19 Claims**



1. An apparatus for forming, in a receiving container a mixture in selected proportions of fluid ingredients selected from a number of such fluid ingredients stored in an array of storage containers each adapted to dispense a respective fluid ingredient, comprising

weighing means adapted to support and continuously monitor the weight of the receiving container,

a movable support for the weighing means so that a receiving container supported thereby can be moved to receive ingredients from successive selected storage containers,

means for initiating dispensing of an ingredient from a selected storage container when the weighing means and supported receiving container are in a position to receive fluid from that storage container,

means for stopping that dispensing of fluid when a predetermined weight of that ingredient has been dispensed into the receiving container, and

a data processor which controls the movement of the weighing means and its support to successive storage containers, ascertains the correct disposition of the weighing means and receiving container relative to the desired storage container, emits a signal to the means for initiating of the respective fluid ingredient when such correct disposition has been ascertained, is adapted to receive information of the weight of the receiving container from the weighing means during dispensing of the ingredient, and emits a signal to operate means for stopping dispensing of the fluid when the receiving container has reached the required weight.

4,526,216

UNLEADED FUEL FILLING SYSTEM FOR TANKS WITHOUT INLET PIPE

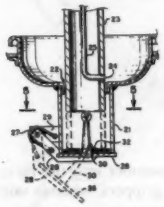
Leo C. Lake, Jr., Anaheim, Calif., assignor to Yamaha Motor Corporation, U.S.A., Cypress, Calif.

Filed May 16, 1983, Ser. No. 494,804

Int. Cl.³ B67D *5/372;* **B65B** *31/06*

U.S. Cl. 141—348 **5 Claims**

5. An insert for a liquid inlet at the top of a tank for receiving a nozzle spout having a vacuum port about 0.87 inches from the tip comprising a mouth having a wide opening of about 2.5 to 3 inches in diameter at the top and a small opening of about 0.84 inches in diameter at the bottom, said mouth being about 0.87 inches deep, a throat extending about 1 to 1.25 inches from the bottom of said small opening, said throat having a diameter of about 0.87 inches a disc valve outside of said throat adapted to engage the bottom of said throat for closing said throat; a compression coil spring inside of said throat for holding said valve closed; and a first grid connected to said throat for preventing said nozzle spout from being inserted past the end of said throat; said valve having means connected thereto to



engage said spout for opening said throat when said spout is inserted into said throat, thereby to permit liquid from said spout to pass into said tank through said throat only while said spout is inserted into said throat, and to cause said liquid to back up in said mouth if said spout is not inserted into said tank, said throat opening means having one end attached to said disk valve, and the other end attached to a second grid in said throat for the nozzle spout to bear against, with said compression coil spring between said second grid and said first grid.

4,526,217

HEAVY DUTY PNEUMATIC RADIAL TIRES

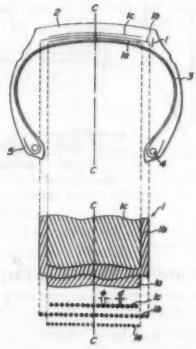
Muneyoshi Maeda, Kodaira; Kazuyuki Endo, and Hikaru Tansei, both of Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 415,073, Sep. 7, 1982, abandoned. This application Apr. 30, 1984, Ser. No. 604,419

Claims priority, application Japan, Sep. 11, 1981, 56-142424

Int. Cl.³ B60C *9/20*

U.S. Cl. 152—527 **5 Claims**



1. A heavy duty pneumatic radial tire comprising; a carcass composed of at least one rubberized ply containing cords arranged substantially in a radial plane of the tire and a belt superimposed about a crown portion of the carcass just beneath a tread and composed of at least four rubberized belt plies each containing cords therein, each ply containing cords therein, and each of the cords in at least one belt ply other than the first to third belt plies has an elongation at break of cord being not less than 1.5 times that of each of the cords in said

first to third belt plies, a first belt ply nearest to said carcass among said plies of the belt contains metal cords arranged at an angle of 25° to 50° without crossing with metal cords of a second belt ply near said carcass next to said first belt ply with respect to a central circumferential line of the tire, said first belt ply having cords arranged at a ratio of the distance between adjacent cords (d) to the diameter of the cord (ϕ) of 0.9–1.1; and said second belt ply and a third ply near said carcass next to said second belt ply contain metal cords, whose tensile strength being 1.6 to 1.8 times that of the metal cord of said first belt ply, said metal cords of the second and third belt plies arranged at an angle of 10° to 30° and smaller than the cord angle of said first belt ply, said second and third belt plies crossing with each with respect to the central circumferential line of the tire and each of said second and third belt plies has a ratio of distance between adjacent cords (d) to diameter of the cord (ϕ) of 0.4–0.7.

4,526,218

PROFILE RAIL FOR THE FASTENING OF FLEXIBLE SHEET-LIKE STRUCTURES

Helmut F. Lanner, Bondstorpsvägen 11, S-567 00, Vaggeryd, Sweden, assignor to Conny Sjolin, Vaggeryd, Sweden

Filed Apr. 1, 1982, Ser. No. 364,457

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1981, 8109868[U]

Int. Cl.³ E06B *3/30*

U.S. Cl. 160—374.1 **7 Claims**

1. A profile rail used in securing a flexible sheet-like structure onto a substantially flat carrier having edges, said profile rail being U-shaped in cross-section and defined by a pair of flanges and a substantially flat web having opposite edges with a said edge connected to a said flange along a line, said profile rail being detachably secured to said carrier by said flanges with said flanges resiliently clamping an edge of said carrier with said flat web embracing an edge of said carrier, and a plurality of teeth disposed along said line extending longitudinally of said rail outwardly from said flat web adjacent one of said flanges, said one of said flanges being narrower than the other of said flanges so that said teeth may penetrate said sheet-like structure in a direction opposing tension applied of said teeth by said sheet-like structure.

4,526,219

PROCESS OF FORMING FOUNDRY CORES AND MOLDS UTILIZING BINDER CURABLE BY FREE RADICAL POLYMERIZATION

William R. Dunnavant; Heimo J. Langer, both of Columbus, and Grant O. Sedgwick, Gahanna, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 314,649, Oct. 26, 1981, abandoned, which is a continuation of Ser. No. 110,025, Jan. 7, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 431,962

Int. Cl.³ B22C *9/02, 1/20*

U.S. Cl. 164—16 **20 Claims**

1. A process for forming shaped foundry articles comprising:
(a) distributing on a foundry aggregate a bonding amount of a binder material, said binder material comprising a reactive ethylenically unsaturated polymer; wherein said polymer is selected from the group of epoxy arcylate reaction products, polyester/urethane/acrylate reaction products, polyether acrylate, polyester acrylates, or mixtures thereof;
(b) shaping the aggregate into the desired foundry article; and
(c) polymerizing the binder material by means of a free radical initiator, said initiator comprising an organic peroxide and a catalytic agent wherein said catalytic agent comprises gaseous sulphur dioxide.

4,526,220

METHOD FOR IMPROVING PERFORMANCE OF CHAPLETS IN METAL CASTING

John R. Scherer, 1251 S. Reynolds Rd., Apt. 175, Toledo, Ohio 43615

Filed Mar. 16, 1984, Ser. No. 590,164

Int. Cl.³ B22C *21/14;* **B22D** *33/04*

U.S. Cl. 164—137 **2 Claims**

1. A method for producing and using a metal chaplet, as used for metal casting operations, comprising the steps of:
(a) immersing said metal chaplet into a mixture of water and borax;
(b) removing said chaplet from said mixture of water and borax;
(c) placing said immersed chaplet into a metal casting mold for use therein.

4,526,221

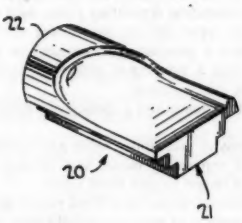
CRUCIBLE FOR USE WITH BROKEN ARM-TYPE CENTRIFUGAL CASTING MACHINE

Arun Prasad, Cheshire, Conn., assignor to Futurdent Industries Inc., New Brunswick, N.J.

Filed Jan. 23, 1984, Ser. No. 573,146

Int. Cl.³ B22D *13/10, 13/06*

U.S. Cl. 164—289 **9 Claims**



1. A crucible in which metallic materials can be melted and which is adapted to be used on a broken arm-type centrifugal casting machine so as to supply molten metallic materials to a casting mold, said crucible including an elongated base section and a top section, said top section being generally in the form of a half cylinder, said base section and said top section providing the crucible with a front surface at its front end, a rear surface at its rear end, a bottom surface, left and right sides and a curved top surface; a cavity which extend along the crucible from its rear end to its front end and in effect results in removal of a large portion of said top section, said cavity providing an exposed crucible floor, left and right side walls and a generally funnel-shaped channel in a head portion of said top section, said generally funnel-shaped channel extending to said front surface to provide a discharge opening therein which is centered with respect to an imaginary vertical plane which divides the crucible in half along its longitudinal dimension, said right wall being always correspondingly higher than said left side wall and each of said left and right side walls increasing in height and sloping over toward each other as they extend toward the front end of the crucible, and said crucible floor, which extends from the rear end of the crucible to a point within the head portion of the top section, including a portion which extends downwardly from horizontal as it slopes

toward the front end of the crucible and concurrently downwardly toward the right side of the crucible so as to provide a lowermost area of said crucible floor within the head portion of said top section.

4,526,222

LOW PRESSURE CASTING METHOD AND APPARATUS

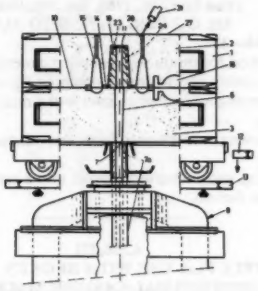
Hansrudolf Helg, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Switzerland

Filed May 5, 1983, Ser. No. 491,999

Claims priority, application Switzerland, May 14, 1982, 3007/82

Int. Cl.³ B22D *17/06, 17/30*

U.S. Cl. 164—340 **16 Claims**



1. A foundry mold for low pressure casting wherein metal melt is forced upwardly through a riser pipe into the mold, comprising:

upper and lower mold parts horizontally divided by a horizontally extending separating plane, said upper mold part having an upper surface, said lower mold part having a top surface a pouring gate opening in a lower surface thereof and a pouring-in channel extending upwardly from said gate opening;

a hollow mold space and a casting run defined in said mold parts;

a blind recess in said upper mold part extending upwardly from said separating plane, said casting run connecting said blind recess to said mold space;

a core contained within said blind recess and supported on said top surface of said lower mold part, said core having an overflow channel at a top end thereof between said upper surface and a highest point of said mold space or said casting run such that said core, said recess and said casting run form a siphon-like passage for melt conveyed through said gate opening and said pouring-in channel.

4,526,223

ROLL CASTER APPARATUS HAVING CONVERGING TIP ASSEMBLY

Daniel K. Ai, New Kensington, and Ho Yu, Murrysville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 9, 1984, Ser. No. 597,834

Int. Cl.³ B22D *11/06*

U.S. Cl. 164—428 **8 Claims**

1. An improved roll caster tip apparatus comprising:

(a) a molten metal reservoir comprising a bottom plate and at least one sidewall; and

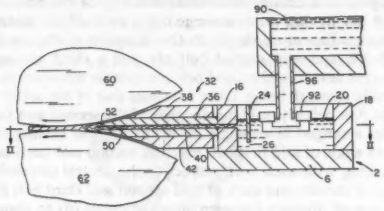
(b) a tip member attached to said sidewall comprising:

(i) a top wall;

(ii) a bottom wall; and

(iii) a pair of side riser members between said top wall and said bottom wall,

said side riser members and said top wall and bottom wall forming a passageway terminating in an exit port for molten metal to flow from said reservoir to a pair of rollers, said side risers converging toward one another at said exit port by being



spaced apart a shorter distance at said exit port than at said sidewall whereby metal flow separation along said side risers will be mitigated, thereby providing uniform metal velocity across the width of the tip member.

4,526,224

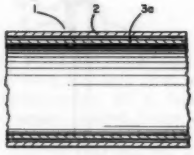
MEANS FOR COOLING A BODY

Harald Krogsrud, Gjettum, Norway, assignor to Elkem A/S, Oslo, Norway

Filed Mar. 18, 1982, Ser. No. 217,688

Int. Cl.³ F28B *1/00;* **F25B** *41/06;* **B60H** *1/00;* **B61D** *27/00*

U.S. Cl. 165—1 **2 Claims**



1. In the process of cooling members by passing a coolant liquid through one or more conduits attached to the members, wherein the temperature of the members can cause at least a portion of the coolant liquid to vaporize, the improvement comprising the steps of placing in said one or more conduit a flexible hose, which is permeable to said coolant liquid, said flexible hose setting up a boundary layer in said conduit, vaporizing liquid coolant between the outside wall of the hose and the inside wall of the conduit, contracting the flexible hose due to the vapor formation thereby providing an enclosing vapor collar around said hose, increasing the axial velocity of the liquid coolant flow by the contraction of the permeable hose whereby additional heat externally supplied will be transferred to the coolant through an atmosphere of vapor.

4,526,225

BUILDING ELEMENT FOR HEAT STORAGE AND TRANSFER

Austin N. Stanton, 3017-15 Stonehenge La., Carrollton, Tex. 75006

Continuation of Ser. No. 306,313, Sep. 28, 1981, abandoned. This application Nov. 16, 1983, Ser. No. 552,399

Int. Cl.³ F28D *13/00*

U.S. Cl. 165—104.11 A **2 Claims**

1. A building element comprising:

two spaced apart vertical side walls being substantially parallel and co-extensive;

a vertical outside wall having an outwardly facing surface exposed to an outdoor environment;

a vertical inside wall being substantially parallel to and co-extensive with said outside wall, and having an out-

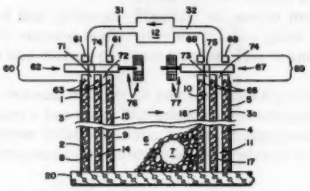
wardly facing surface exposed to an inside space of a building;

four vertical inner walls being parallel to and disposed between said outside and inside walls;

said outside wall and said first inner wall being spaced apart to define a first duct;

said first and second inner walls being spaced apart to define a second duct;

said second and third inner walls being spaced apart to define a heat storage bin;



said third and fourth inner walls being spaced apart to define a third duct;

said fourth inner wall and said inside wall being spaced apart to define a fourth duct;

said side walls being integrated with said outside, inside and inner walls for support of each end of said inner walls;

said heat storage bin being filled with a granular heat storage material for the storage of heat; and

impermeable fibrous mastic coatings on the outwardly facing surfaces of said outside and inside walls, to prevent the passage of air therethrough.

4,526,226

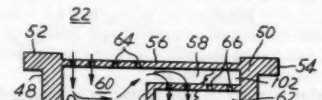
MULTIPLE-IMPINGEMENT COOLED STRUCTURE

Edward S. Hsia, Cincinnati; Raghuram J. Emani, and John H. Starkweather, both of West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 31, 1981, Ser. No. 297,688

Int. Cl.³ F28F *9/22, 13/02*

U.S. Cl. 165—109 R **8 Claims**



1. A multiple-impingement cooled structure for defining a boundary of a gas flowpath comprising:

(a) an element including an inner surface and an outer surface facing toward and away from said gas flowpath, respectively, and further including upstream and downstream edges and at least one rib extending from said outer surface and generally parallel to said downstream edge;

(b) an upstream flange and a downstream flange disposed on opposite sides of said rib and extending from said outer surface of said element near said upstream and downstream edges, respectively, thereof;

(c) a first baffle and a second baffle, said first baffle extending between said upstream and said downstream flanges and spaced from said element, from said rib and from said second baffle for defining therewith a first cavity, said second baffle extending between said rib and said downstream flange and spaced between said first baffle and said element for defining therewith a second cavity, said first baffle and said second baffle each including a plurality of impingement holes therethrough for together directing cooling air from a source thereof to impinge sequentially upon the portion of said element within said first cavity and then upon the portion of said element within said second cavity; and

(d) fluid communication means between at least one of the cavities and the exterior of said structure.

4,526,227

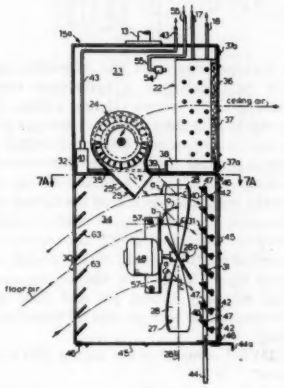
SPOT THERMAL OR ENVIRONMENTAL CONDITIONER

Gary C. Baker, Jonesboro, Ark., assignor to William B. Hurt, Jonesboro, Ark., a part interest

Continuation-in-part of Ser. No. 405,437, Aug. 5, 1982,. This application Jul. 25, 1983, Ser. No. 516,644

Int. Cl.³ F24B *1/06*

U.S. Cl. 165—124 **6 Claims**



1. In a building structure having a floor and a ceiling for limiting the vertical movement of the air in the space therebetween, the air temperature in a lower level floor zone of said space being lower than that in an upper level ceiling zone, and a housing having at least one compartment therein mounted substantially between said zones, a spot thermal conditioning apparatus selectively operable in warming and cooling modes, respectively, and comprising

(a) a first means for flowing a first mass of said warmer ceiling zone air into said compartment;

(b) a second, independent means for concurrently flowing a second mass of said cooler floor zone air into the compartment, said first and second masses intersecting at an acute angle to form an air mixture having a temperature intermediate the temperature of the air in said ceiling and floor zones;

(c) means for varying the ratio between said flowing masses to cause predominantly warmer ceiling zone air and subordinately cooler floor zone air to be flown into said mixture during the warming mode and subordinately warmer ceiling zone air and predominantly cooler floor zone air to be flown into the mixture during the cooling mode;

(d) means for projecting a concentrated tightly focused, high velocity stream of said air mixture horizontally and downwardly from said compartment to an open spot work area substantially surrounded by said floor zone air; and

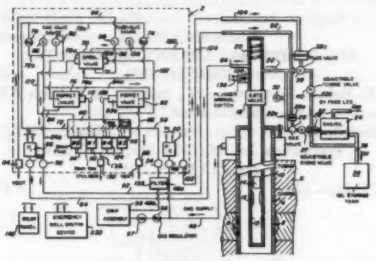
(e) a third means for flowing a third mass of warmer ceiling zone air into said compartment and upwardly toward the ceiling in a separate circuit from the flow of air moved by the first means for flowing a mass of said warmer ceiling zone air.

4,526,228

APPARATUS FOR OPERATING A GAS AND OIL PRODUCING WELL

Samuel R. Wynn, R.F.D. #7, Box 348, Marietta, Ohio 45750

Filed Jan. 18, 1983, Ser. No. 459,000
Int. Cl.³ E21B *43/12, 47/06*
U.S. Cl. 166—53 **30 Claims**



1. Apparatus for operating a gas and oil producing well of the plunger lift type including a cylindrical tubing (**10**) mounted in concentrically spaced relation within a vertical well casing (**4**) that is embedded in an oil and gas producing formation, the casing and tubing being perforated adjacent their lower ends; a plunger (**14**) mounted for vertical movement in said tubing, said plunger normally having an initial lower position adjacent the lower end of the tubing and being vertically displaceable toward an upper position adjacent the upper end thereof; an outlet conduit (**22**) connected at one end with the upper end of the tubing, said outlet conduit including gas and oil branch legs (**22***a*, **22***b*) for discharging gas and oil, respectively; and normally closed gas and fluid discharge valves (**26**, **38**) connected in said gas and oil branches, respectively, comprising

(a) means (**U25**) for comparing the casing (**50**) and tubing (**66**) pressures;

(b) means (**26***a*) for opening the gas discharge valve when the difference between casing pressure and tubing pressure is greater than a selected difference value (**R81**), thereby to deliver gas via the gas branch leg, and to permit the build up of oil in the tubing above the plunger;

(c) means (**38***a*) for opening the fluid discharge valve when the casing pressure exceeds a selected lift value (**R84**), whereby the plunger moves upwardly in the tubing, and oil is discharged via the oil branch leg;

(d) means for closing the gas discharge valve when casing pressure falls below a selected casing bleed value (**R82**);

(e) means (**134**) for initially closing the fluid discharge valve when the plunger reaches its upper position adjacent the upper end of the tubing, thereby interrupting the discharge of oil, and initiating the fall of the plunger toward the bottom of the tubing; and

(f) means operable after a given first period following closing of said fluid discharge valve for reopening said fluid discharge valve only when both:

(1) the oil level produces a pressure difference greater than said selected difference value, and

(2) the casing pressure is greater than the selected lift value.

4,526,229

HYDRAULIC PACKER ASSEMBLY

Richard C. Dickerson, Slidell, La., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Feb. 14, 1983, Ser. No. 465,836
Int. Cl.³ E21B *23/04, 33/129*
U.S. Cl. 166—120 **18 Claims**

1. A hydraulic packer assembly for a well casing, which comprises:

a packer body having an internal axial bore extending therethrough;

first sealing means mounted on said body for forming a fluid tight seal between said body and a well casing;

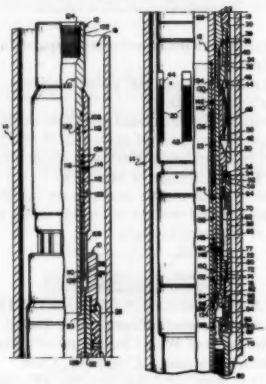
gripping means mounted on said body for securing said body to the well casing;

actuating means for expanding said sealing means and gripping means into contact with the well casing, including a first piston slidable in response to fluid pressure within a first cylinder and having first port means for conveying fluid pressure to said cylinder;

a catch on an upper portion of said packer body extending from an internal surface thereof;

setting tool means for releasably coupling said body to a tubing string and for conveying fluid pressure in the tubing string to said first port means to operate said actuating means;

releasable latch means on said setting tool movable between a locking position engaging said catch and a release position disengaged from said catch, said latch means including latch members biased toward said release position and



a reciprocating sleeve for maintaining said latch members in said locking position, said reciprocating sleeve being actuated by a piston and cylinder means and setting tool release port means in said setting tool for conveying fluid pressure from a space between said setting tool means and the well casing and above said first sealing means to said piston and cylinder means;

a tubular mandrel on said setting tool means with a collet coupled to said tubular mandrel and supporting said latch members, said collet being laterally spaced from said tubular mandrel forming an annular space defining an annular cylinder of said piston and cylinder meeans and slidably receiving an annular piston of said piston and cylinder means, said reciprocating sleeve being coupled to said annular piston for simultaneous movement therewith, said setting tool release port means being a radially extending aperture in said collet; and

second seal means on said setting tool means for providing a fluid tight seal between said setting tool means and said body bore.

4,526,230

DOUBLE WALLED SCREEN-FILTER WITH PERFORATED JOINTS

Bozidar Kojicic, New York, N.Y., assignor to Seminole Energy Tools, Inc., Houston, Tex.

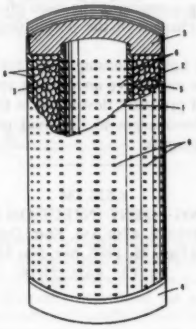
Filed Aug. 2, 1982, Ser. No. 404,146
Claims priority, application Yugoslavia, Aug. 4, 1981, 1921/81
Int. Cl.³ E21B *43/08*
U.S. Cl. 166—236 **8 Claims**

1. A double wall screen filter adapted to be installed in a hole

formed in fluid bearing formations and to prevent sanding and silting-in during production, comprising:

(a) a pair of spaced, substantially concentric and cylindrical perforated screen members positioned to define an annular filter space therebetween;

(b) filter means substantially filling the annular filter space for filtering particulate materials from fluid flowing through it, the particulate materials having a tendency to pass into a well;



(c) upper joint means for sealing the upper end of said annular filtering space above the filtering means; and

(d) lower joint means for connecting together lower end portions of said screen members and supporting said filter means, the lower joint means including an annular ring extending between the lower portions to join the inner and outer screen members together and said annular ring having passages for enabling passage of the particulate materials in the filter space to a sedimentation area of the hole below the filter.

4,526,231

PROCESS FOR TERTIARY OIL RECOVERY USING TALL OIL PITCH

Clayton J. Radke, El Cerrito, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 25, 1983, Ser. No. 517,138
Int. Cl.³ E21B *43/22*; C09K *3/00*
U.S. Cl. 166—270 **17 Claims**

1. An oil displacement composition for use in enhancing recovery of residual acidic crude oils comprising:

on aqueous caustic solution in an amount sufficient to maintain a pH of at least about 11;

a small but effective amount of a water soluble multivalent cation provided for in the form of a compatible water-soluble salt thereof for inhibiting alkaline silica dissolution within the reservoir; and

about ¼ to 10% of tall oil pitch soap.

4,526,232

METHOD OF REPLACING A CORRODED WELL CONDUCTOR IN AN OFFSHORE PLATFORM

Robert A. Hughson, New Orleans, and Eddie A. Osborne, Kenner, both of La., assignors to Shell Offshore Inc., Houston, Tex.

Filed Jul. 14, 1983, Ser. No. 513,566
Int. Cl.³ E21B *29/12*
U.S. Cl. 166—339 **7 Claims**

1. Method of replacing a damaged portion of large-diameter well conductor pipe which is closed at the top by a wellhead and extends downwardly through close-fitting circular guide means in the underwater substructure of an offshore platform and into a well previously drilled in the ocean floor, said method comprising,

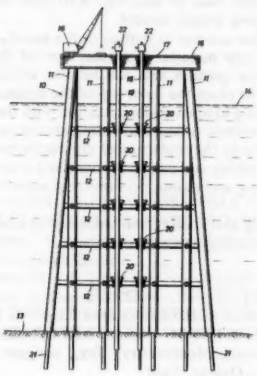
stopping the flow of fluid from the well,

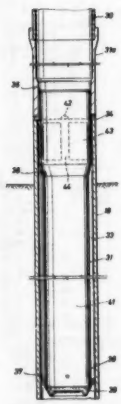
opening the wellhead at the top of the well conductor,

removing at least the upper portions of the concentric tubing and casing strings within the upper part of the well conductor to a point below that portion of well conductor to be cut off and replace,

cutting off the upper damaged portion of the well conductor at a point above the mud line into which the well conductor extends so as to leave a well conductor stub to connect to,

removing the cut-off damaged portion of well conductor from its position over the well conductor stub,





making up a replacement upper portion for the well conductor of a length substantially equal to the damaged original upper portion that was removed,

fixedly securing an elongated lower tubular connector member to the lower end of the replacement conductor portion, said elongated lower tubular connector member being of a diameter to pass through said platform guide means and fit telescopically within the interior of the well conductor stub,

sizing the diameter of the lower connector tubular member such that is seats on the well conductor stub in a radially spaced telescoping manner, with the space between said

member and a sub forming cement flow passages of a length sufficient to contain a cement bond between said member and the interior wall of said stub,

assembling and positioning said replacement conductor portion, with its tubular connector member at the lower end thereof, above the well conductor stub extending up from the ocean floor,

lowering said tubular connector member through said platform guide means into telescoping spaced engagement with the interior of the well stub and seating the replacement conductor portion on the well stub so as to extend within the well stub,

pumping cement down through said tubular connector member and out the lower end thereof and up the annular space formed between the tubular connector member and the interior wall of said well stub over substantially the telescoping length thereof,

allowing the cement to harden in the annular space,

removing any material from the bore of the replacement conductor portion and the tubular connector attached thereto to place the open top of the replacement conductor portion in open communication with the upper ends of the concentric tubing and casing strings within the well,

re-installing in the replacement conductor portion the concentric tubing and casing portions and connecting them to the tubing and casing portions that were left in the well, and

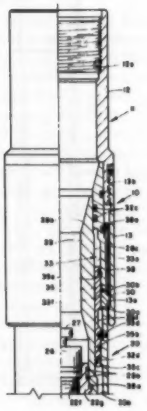
re-installing and closing the wellhead at the top of the replacement conductor portion.

4,526,233

RELEASABLE COUPLING FOR TUBING CONVEYED SUBTERRANEAN WELL PERFORATING GUN

Gregg W. Stout, Montgomery, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Jan. 20, 1984, Ser. No. 572,437
Int. Cl.³ E21B *23/04, 43/116*
U.S. Cl. 166—377 **17 Claims**



1. A releasable coupling for connecting a subterranean well perforating gun to a tubular tool string, said perforating gun being of the type including a hollow housing that receives a charge of pressured gas following discharge of the perforating gun, comprising, in combination: a first tubular assembly having means on its lower end for threadably connecting with said hollow housing; a second tubular assembly having means on its upper end for threadably connecting with the tubular tool string; the lower end of said second tubular assembly being disposed in concentric, overlapping relation to the upper end of said first tubular assembly; radially shiftable latching means normally interconnecting said overlapped portions of said first and second tubular assemblies, thereby securing the perforating gun to the tubular tool string; axially shiftable piston means operatively connected in one position to said radially shiftable latching means to hold same in said normal interconnecting position; and conduit means for supplying pressured fluid from said hollow housing to said piston means to axially shift same out of said one position, thereby permitting said radially shiftable latching means to disconnect said first and second tubular assemblies.

17. The method of uncoupling a well perforating gun from a tubular tool string comprising the steps of:

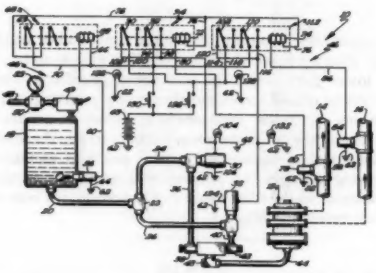
1. disposing the charges of the perforating gun in a hollow housing;
2. connecting the hollow housing to the tubular tool string by a fluid pressure responsive uncoupling apparatus; and
3. supplying fluid pressures developed in the hollow housing by firing of the charges to the fluid pressure responsive uncoupling apparatus.

4,526,234

WETTING AGENT INJECTION SYSTEM

Ralph V. Little, 1910 N. 47th Ave. East, Duluth, Minn. 55804

Filed Oct. 21, 1983, Ser. No. 544,204
Int. Cl.³ A62C *35/00*
U.S. Cl. 169—15 **9 Claims**



1. Wetting agent injection system for use with a firefighting apparatus, with the firefighting apparatus having a positive pressure pump including a suction side and including at least a first discharge line, comprising, in combination: a wetting agent supply tank; at least a first solenoid valve having an open position and a closed position; means for providing fluid communication from the wetting agent supply tank to the solenoid valve; means for providing fluid communication between the solenoid valve and the suction side of the positive pressure pump of the firefighting apparatus; and means for controlling the flow and flow amount of the wetting agent from the supply tank to the pump, with the control apparatus comprising, in combination: means for connecting the interior of the wetting agent supply tank to a source of pressurized air, with the pressurized air connecting means including means for regulating the air pressure supplied into the wetting agent supply tank; means for detecting the level of the wetting agent in the supply tank; means for detecting flow of water through the discharge line of the firefighting apparatus; and means for energizing the solenoid valve according to the level of the wetting agent in the wetting agent supply tank and the flow of water from the pump through the discharge line for moving the solenoid valve to its closed position preventing fluid flow from the supply tank to the pump when the condition of the supply tank is detected by the level detecting means as being empty, for moving the solenoid valve to its closed position preventing fluid flow from the supply tank to the pump when the condition of the supply tank is detected by the level detecting means as not being empty and the condition detected by the flow detecting means is that no flow is occurring through the discharge line and for moving the solenoid valve to its open

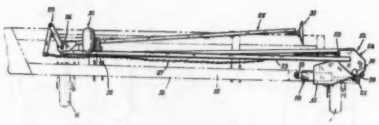
position allowing fluid flow from the supply tank to the pump when the condition of the supply tank is detected by the level detecting means as not being empty and the condition detected by the flow detecting means is that flow is occurring through the discharge line.

4,526,235

AGRICULTURAL ROW MARKER

Jon E. Kinzenbaw, Williamsburg, Iowa, assignor to Kinze Manufacturing, Inc., Williamsburg, Iowa

Filed Sep. 27, 1982, Ser. No. 424,382
Int. Cl.³ A01B *17/00*
U.S. Cl. 172—126 **2 Claims**



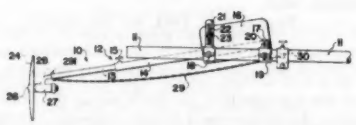
1. A folding marker for an agricultural implement comprising: a marker arm; frame means for mounting said arm for pivotal motion about a first pivot location such that said arm moves between a generally horizontal use position in which said arm extends laterally outwardly of said frame and a generally horizontal storage position in which said arm extends inwardly; a swing link providing second, third and fourth spaced pivot locations; an hydraulic cylinder having one end pivotally connected to said frame means and the other end pivotally connected to said swing link at said third pivot location; means for pivotally mounting said swing link at said second pivot location to said frame means such that said third and fourth pivot locations move in a path about said first pivot location as said cylinder extends and retracts; and a push/pull link pivotally mounted at one end to said swing link at said fourth pivot location and pivotally mounted at the other end to said marker arm; whereby as said cylinder extends to rotate said marker toward the storage position and as said marker arm passes through top dead center, said push/pull link is placed in tension to support the weight of said marker arm and the angular displacement of said marker arm about said first pivot location for equal increments of extension of said hydraulic cylinder is reduced as said marker arm approaches the storage position to thereby decelerate said marker arm as it approaches the storage position.

4,526,236

FIELD MARKER FOR A SPRAYER BOOM

Ralph O. Jacobsen, Kyle, Canada, assignor to Kyle Welding & Machine Shop Ltd., Kyle, Canada

Filed Feb. 13, 1984, Ser. No. 579,448
Claims priority, application Canada, Mar. 8, 1983, 423114
Int. Cl.³ A01B *69/02*
U.S. Cl. 172—126 **6 Claims**



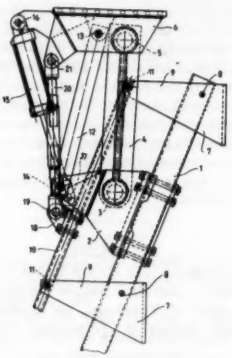
1. A field marker for attachment to a spray boom comprising a support arm, means for mounting the support arm on one end of the implement such that it extends generally outwardly from the end of the implement and downwardly therefrom towards the ground, a disc, means mounting the disc on the end of the support arm for rotation about the axis of the disc in contact with the ground and means for changing the angle of the disc relative to the support arm, said support arm being formed from a single elongate tubular member and providing the sole rigid interconnection between said disc and said boom, said mounting means including a first collar for surrounding the boom, a second collar for surrounding the boom spaced from the first, a support member mounted on said first and second collars and providing front and rear parallel walls for in use standing in vertical planes longitudinal of said boom, means pivotally mounting said support arm between said walls for movement in a vertical plane therebetween, a third a third collar for surrounding the boom, said third collar supporting a strut for projecting at right angles to the boom forwardly therefrom and flexible coupling means for extending from said boom to an end of said strut remote from the boom and therefrom to said support arm for resisting rearward movement of said support arm relative to the boom.

4,526,237

MULTI-FURROW PLOW ASSEMBLY WITH ADJUSTABLE PLOWSHARE MOUNTS

Magne Skjaeveland, Kvernaland, Norway, assignor to Kverneland A/S, Kvernaland, Norway

Filed May 6, 1983, Ser. No. 492,129
Claims priority, application Norway, Jun. 28, 1982, 822177
Int. Cl.³ A01B *65/02*
U.S. Cl. 172—647 **4 Claims**



1. In a multi-furrow plow assembly wherein a plurality of plowshare mounts are supported on a frame for adjustment for plowing different width strips, by means of a hydraulic cylinder and a strut, which together with the frame and the plowshare mounts form a plurality of interacting parallelograms, with the frame being pivotally attached to a drag beam, which is connected to a tractor hitch for coupling to a tractor, the improvement comprising: a first link, one end of which being pivotally connected to said tractor hitch and the opposite end of which being pivotally connected to said frame, a second link, one end of which being pivotally connected to said strut and the opposite end of which being pivotally connected to said tractor hitch so that when the hitch is coupled to the tractor and said frame is pivoted for changing the strip width of said plow assembly, the first plowshare mount closest to said tractor hitch is displaced in a predetermined relationship with respect to the centerline of the tractor and the orientation of the plowshare mounts in relation to said centerline is maintained.

4,526,238

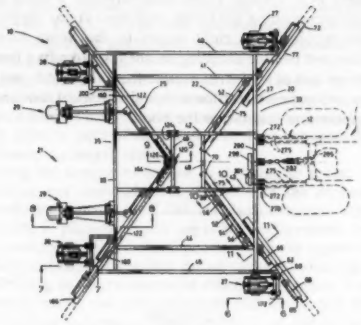
LAND LEVELING DEVICE

Leslie F. Williams, Buttonwillow, Calif., assignor to Eagle Tractor Company, Inc., Buttonwillow, Calif.

Filed Jan. 17, 1984, Ser. No. 571,470

Int. Cl.³ E02F *3/62*

U.S. Cl. 172—780 **10 Claims**



1. A land leveling device comprising a frame having forward and rearward end portions; a pair of elongated blades mounted in the forward end portion of the frame and rearwardly convergent therefrom; a pair of elongated blades mounted on the rearward end portion of the frame and forwardly convergent therefrom, the blades each having a downwardly disposed edge for scraping engagement with the soil; means supporting the forward blades for earth traversing movement forwardly with the frame and for transverse tilting adjustment to form a somewhat smoothed substantially transversely horizontal path of travel; and means supporting the rearward blades for earth traversing movement forwardly along the smoothed path in following relation to the forward blades and fore and aft tilting adjustment to smooth the path longitudinally; and a pair of elevationally adjustable caster wheels mounted in supporting relation on the rearward portions of the frame selectively to elevate the support means and blades free of the ground for transport and to lower the blades onto the path for scraping engagement therewith.

4,526,239

UNDERWATER HYDRAULIC TOOL

Hidehiko Kaneda, Ibaraki; Natsuo Inagaki, and Hitoshi Yamaguchi, both of Yokohama, all of Japan, assignors to Japan Marine Science & Technology Center, Yokosuka, Japan

Filed Apr. 12, 1983, Ser. No. 484,234

Claims priority, application Japan, Apr. 12, 1982, 57-51815[U]

Int. Cl.³ B25D *17/14*

U.S. Cl. 173—73 **8 Claims**

1. An underwater hydraulic tool comprising:

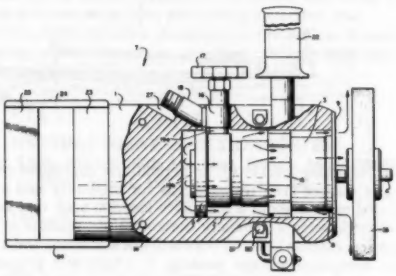
a hydraulic motor having a motor casing with an inlet port and an outlet port therein for receiving and discharging water under pressure and a rotating shaft mounted in said motor casing rotated by water under pressure, said rotating shaft having a front end protruding from said motor casing for holding a working tool member thereon;

valve means connected to said inlet port;

a rear mounting member attached to a rear part of said hydraulic motor casing, said rear mounting member having openings spaced circumferentially therearound, at least portions of said openings being located outwards of the outer circumferential wall of said hydraulic motor casing;

a front mounting member attached to a front part of said hydraulic motor casing, said front mounting member having openings spaced circumferentially therearound, at least portions of said openings being located outwards of said outer circumferential wall of said hydraulic motor casing; and

a housing made of a bouyant material which is resistant to pressure, said housing having a hollow space therein opening out of the front end thereof, said hydraulic motor being positioned in said space with said front end of said rotating shaft protruding forward of said housing, said rear mounting member having the periphery thereof engaged with the inner wall of said housing defining said space and said front mounting member being fixed to said



housing at said opening of said hollow space, at least portions of said openings in said front mounting member being inwards of the inner wall of said housing, said rear and front mounting members supporting said hydraulic motor casing in said space with the exterior of said hydraulic motor casing spaced from the inner walls of said housing to leave a gap therebetween, said outlet port opening out of said motor casing into said gap, whereby the water under pressure discharged from said outlet port flows along said hydraulic motor casing through the openings in said rear and front mounting members and past the front end of said shaft.

4,526,240

METHOD OF INHIBITING LOST CIRCULATION FROM A WELLBORE

Mark J. McKinley, Linwood, and Douglas D. Applegath, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 17, 1983, Ser. No. 542,872

Int. Cl.³ E21B *33/13*

U.S. Cl. 175—72 **4 Claims**

1. In a well drilling method wherein a drilling fluid is injected into a borehole in the earth during the drilling of the borehole, the improvement which comprises injecting as the drilling fluid a fluid medium containing a fibrous mass which is a hydrophilic absorbent composite comprising (1) a fibrous absorbent which is a wicking substrate and (2) a water-swellable hydrophilic polymer absorbent, which fibrous mass is employed in an amount sufficient to reduce the loss of the drilling fluid via penetration of the porous subterranean structure or formation openings proximate to the borehole, wherein the fibrous mass when wetted with water forms an essentially fluid-tight plug.

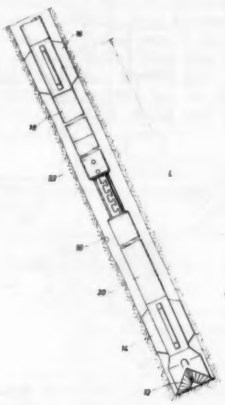
4,526,241
ADJUSTABLE LENGTH DRILLING SUB

Edward O. Anders, Houston, Tex., assignor to Dailey Petroleum Services Corp., Conroe, Tex.

Continuation-in-part of Ser. No. 294,497, Aug. 24, 1981, Pat. No. 4,440,241, which is a continuation-in-part of Ser. No. 19,175, Mar. 9, 1979, abandoned. This application May 27, 1983, Ser. No. 498,744

Int. Cl.³ F21B *7/08*

U.S. Cl. 175—76 **10 Claims**



1. An adjustable length drilling sub for connecting into a drilling string between stabilizers to enable the distance between the stabilizers to be adjusted without removing the pipe string from the well bore, comprising an outer member and an inner member in telescoping relationship with an annular space between the members, said members having threads on opposite sides to connect the members into a drilling string between stabilizers with one member connected to the upper portion of the drilling string and the other to the lower portion, protuberance means on one of the members extending into the annular space between the members toward the adjacent surface of the other member, means on the adjacent surface of the other member providing a cavity configured to receive the protuberance means when the members are rotated relative to each other in one direction and to hold the members from further rotation relative to each other in said one direction and limited axial movement to enable torque in said one direction and weight to be transmitted from one member to the other, and to allow said members to move axially relative to each other when the members are rotated relative to each other in the opposite direction to move the protuberance means out of engagement with the cavity means.

4,526,242
DRILLING DEVICE

Hans Mathieü, Saarbrücken-Bischmisheim, and Jürgen Hochstrasser, Saarbrücken, both of Fed. Rep. of Germany, assignors to Elisabeth Hochstrasser geb. Wack and Jurgen Hochstrasser, both of, Fed. Rep. of Germany

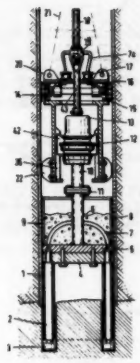
Filed Mar. 26, 1982, Ser. No. 362,096

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3114612

Int. Cl.³ E21B *25/10*

U.S. Cl. 175—94 **9 Claims**

1. A drilling device which may be lowered into a drilled hole to be driven into hard stone, particularly rock, consisting of a drive means, a drill which is rotated by the drive means and a clamping device which engagable with the inside wall of the drilled hole and/or the inside wall of the piping, and which serves to transfer the torque of the drive means to the drill wherein the drive means, the drill and the clamping device are connected as one unit which may be fastened to the cable of a hoist or a drilling linkage with the drill being axially movable relative to the drilling pipe over a range corresponding with one working stroke and contrary to the clamping device characterized in that the drill comprises a ring-shaped housing **(1)**, the outside diameter of which corresponds with the diameter of the drilled hole, a top plate, several cutting tools **(2,23,24)** installed in the top plate at equal distances from each other, parallel with the longitudinal axis of the drilling device, and serving to free a drilling core and bore crowns **(3,26)** mounted



on the cutting tools which produce impact impulses in an axial direction and/or additional rotary movement by way of additional drive means, the clamping device **(12,14)**, the drive means **(13)** for the pipe-shaped housing and the additional drive means for the cutting tools **(2,23,24)** being activated by a mutual fluid medium, and a check valve **(19)** which prevents simultaneous activation of the clamping device and the drive means for the housing being installed between the clamping device **(12,14)**, the drive means for the housing **(1)** and the drive means for cutting tools **(2,23,24)** in the line containing the fluid medium **(18)**.

4,526,243
DRILLING HEAD

David E. Young, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 23, 1981, Ser. No. 323,758

The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.

Int. Cl.³ E21B *3/04*

U.S. Cl. 175—195 **8 Claims**

1. A drilling head comprising

a stator having an opening therethrough,

a rotor disposed in said stator opening and having a passage through which a drill string drive tube may extend,

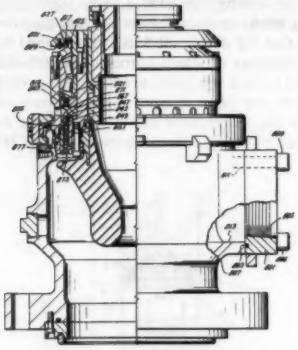
bearing means rotatably mounting the rotor in the stator, said bearing means including an outer stationary race and an inner rotating race and rolling elements for rolling in lubricant between said races,

downwardly converging flexible means carried by the rotor adapted to engage the drive tube of a drill string,

rotating seal means to seal between the rotor and stator,

first means sealing between said stator and rotor above said bearing means and comprising inner and outer telescoping members with first double lip seal means therebetween, said inner member being fixed relative to said outer race and said outer member being fixed relative to said inner race,

said first double lip seal means including an interior face exposed to said lubricant and an exterior face exposed to



the atmosphere, the exterior face of said first double lip seal means being downwardly facing.

4,526,244

METHOD FOR CONTINUOUS WEIGHING OF DIVIDED PRODUCTS AND APPARATUS FOR PUTTING METHOD TO USE

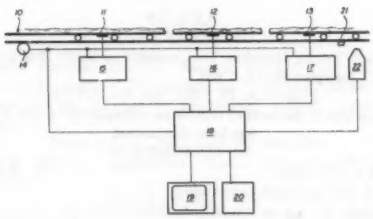
Jean-Marie Chauveau, Cortaillod, Switzerland, assignor to Hasler Freres International S.A., Cortaillod, Switzerland

Filed Mar. 23, 1984, Ser. No. 592,707

Claims priority, application Switzerland, Mar. 24, 1983, 1617/83

Int. Cl.³ G01G *11/14*

U.S. Cl. 177—1 **11 Claims**



1. A method for continuous weighing of divided products transported on a conveyor belt, which comprises: defining a unit of linear displacement of the conveyor belt and associating a respective space variable with a plurality of theoretical reference points regularly disposed along the belt, said respective space variable corresponding to a total number of these units counted from the point of origin of the belt, generating weight data corresponding to the instantaneous measurement of the weight of the belt and/or of the products conveyed by at least three weighing stations disposed the length of the belt, and storing the weight data obtained from said weighing stations in a memory, and, obtaining weight indications by comparing the generated data for a particular reference point upon the belt for a corresponding determinate space variable.

4,526,245

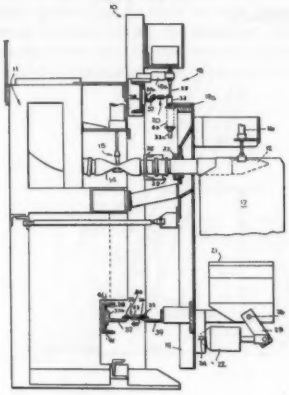
FORCE BALANCING WEIGHING SYSTEM

Walter Ruf, Sandy, and Robert G. Kelley, South Jordan, both of Utah, assignors to St. Regis Corporation, New York, N.Y.

Filed Jul. 5, 1983, Ser. No. 510,679

Int. Cl.³ G01G *19/00, 21/24*

U.S. Cl. 177—160 **7 Claims**



1. A force balancing system for use in apparatus which includes a weighing section for weighing an object, said system comprising:

a first pair of horizontally spaced flexure elements disposed in a horizontal plane adjacent the upper region of the weighing section;

a second pair of horizontally spaced flexure elements disposed in a plane adjacent the lower region of the weighing section and parallel to said first plane;

a stiffener member extending between and secured to both flexure elements of each pair; and

means connecting each flexure element to said weighing section and to a fixed member whereby said flexure elements may flex under load to permit only vertical movement of said weighing section regardless of whether the forces applied to said weighing section during weighing of the object are offset relative to the vertical centerline of the weighing section.

4,526,246

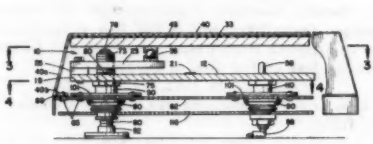
WATER-RESISTANT WEIGHING APPARATUS

Stephen A. Patoray, Spartanburg, S.C., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Feb. 23, 1984, Ser. No. 582,823

Int. Cl.³ G01G *21/02, 21/28*

U.S. Cl. 177—179 **6 Claims**



1. Water-resistant weighing apparatus comprising a load cell, said load cell including a plate, a beam having a fixed end connected to said plate and strain sensing means on said beam, a platter supported by one of said plate and beam for receiving a weight, said platter enclosing the top and sides of said load cell, a shield connected to the bottom of said platter and en-

closing the bottom of said load cell, means sealing the interface between said platter and said shield, foot means for contact with a support surface, bushing means extending through said shield and connecting the other of said plate and beam to said foot means, and boot means sealing the interface between said bushing means and said shield to prevent moisture from passing said shield.

4,526,247

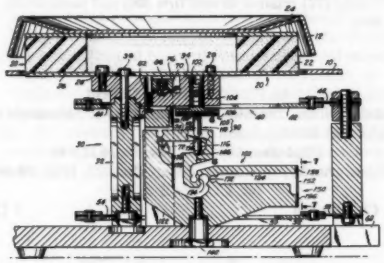
WEIGHING SCALE TRANSDUCER

Errol P. EerNisse, Sandy; Mark D. Gaiser, Salt Lake City, both of Utah; John P. Hanley, West Paterson, N.J.; Walter P. Kistler; Jerome M. Paros, both of Redmond, Wash., and Robert B. Wiggins, West Valley City, Utah, assignors to Ohaus Scale Corporation, Florham Park, N.J.

Filed Jan. 18, 1983, Ser. No. 458,887

Int. Cl.³ G01G *3/14, 21/10, 3/08;* **G01L** *1/10*

U.S. Cl. 177—210 FP **22 Claims**



1. A transducer system for a weighing scale comprising:

(A) a parallelogram flexure assembly including (1) upper and lower vertically spaced, substantially parallel flexure members, each having first and second horizontally spaced sides, the first side of each flexure member being mounted to a fixed mounting, and the second side of each flexure member being vertically movable, and (2) a vertical post member for connecting together the second sides of the flexure members and for supporting an object to be weighed;

(B) a flexure mode crystal resonator transducer member; and

(C) coupling means for transmitting vertical force from the flexure assembly to the crystal resonator member and including a mounting structure having first and second spaced arms, each arm having longitudinally spaced first and second portions, the first arm being fixed relative to the mountings of the flexure members, the arms being pivotally connected to one another adjacent the first portions by a pivotal connection having a pivotal axis perpendicular to the plane defined by the longitudinal axes of the arms, the crystal resonator member being mounted between the second portions of the arms, the first and second arms and pivotal connection of the mounting structure respectively comprising two bars and one pivotal connection of a four bar linkage, and the mounting structure further including the two additional bars and three additional pivotal connections of the four bar linkage.

4,526,248

MOTORIZED CART FOR BERRY-PICKING, WEEDING AND THE LIKE

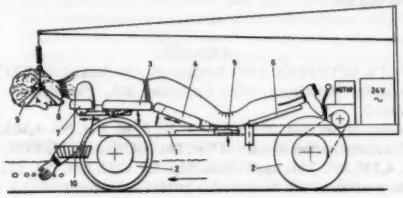
Kjell E. Johansen, Rosenkrantzgt. 11, Drammen, N-3000, Norway

Filed Mar. 15, 1983, Ser. No. 475,536

Int. Cl.³ B62M *67/00*

U.S. Cl. 180—89.1 **2 Claims**

1. A motorized cart for berry-picking, weeding and the like, wherein a pad adjustable to the contours of the human body in a lying position on said cart is provided on a wheel frame, comprising the pad being subdivided into separate, adjustable cushions for a user's chest, stomach, hips/thighs, knees and calves as well as a head support in the form of a forwardly-projecting member with a forehead and/or chin support, said



pad being solely to provide correct anatomic support for the user in the lying position and being independent of any drive means for the cart.

4,526,249

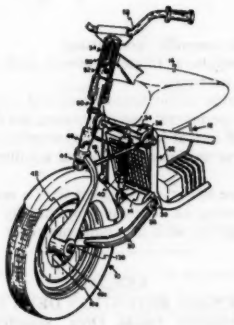
FRONT SUSPENSION SYSTEM FOR A MOTORCYCLE

James G. Parker, 102 S. Capitol, Santa Fe, N. Mex. 87501

Filed May 25, 1983, Ser. No. 498,164

Int. Cl.³ B62K *21/02, 25/16*

U.S. Cl. 180—219 **18 Claims**



1. In a motorcycle having a body and a front wheel, a front suspension and steering system comprising a kingpin having upper and lower ends and extending along one side of said front wheel, a lower control arm, an upper control arm, and a telescoping steering shaft, said lower control arm having first and second ends and being hinged at said first end to said body for swinging motion in a substantially vertical plane, said second end of said lower control arm being connected for universal pivotal motion to said lower end of said kingpin, said front wheel being journalled to said lower end of said kingpin by means of a cantilevered axle assembly extending from one side of said lower end of said kingpin, said lower control arm being arcuately shaped so as to provide clearance for steering motion of said front wheel by rotation of said kingpin, said upper control arm having first and second ends, said first end of said upper control arm being hinged for swinging motion in a substantially vertical plane to said body of said motorcycle, said second end of said upper control arm being connected for universal pivotal motion to said upper end of said kingpin, said upper and lower control arms extending substantially horizontally from said body while in their resting positions, the points of universal pivotal connection between said kingpin and said second ends of said upper and lower control arms lying on a a steering axis that extends upwardly and rearwardly from said axle assembly of the front wheel, said telescoping steering shaft having a lower end connected for universal pivotal motion to

said upper end of said kingpin, whereby said body, kingpin and upper and lower control arms form a parallelogram suspension system that translates road shock loads on said front wheel to vertical swinging motion of said control arms, kingpin and front wheel.

4,526,250

SPACE DIVIDERS AND METHOD OF MANUFACTURE

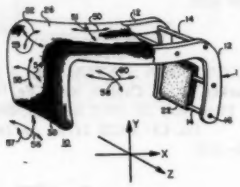
Alexander Messinger, 3725 Lankenau Rd., Philadelphia, Pa. 19131

Division of Ser. No. 201,598, Oct. 28, 1980, Pat. No. 4,403,677, and a continuation-in-part of Ser. No. 4,438, Jan. 18, 1979, Pat. No. 4,230,365. This application Sep. 13, 1983, Ser. No. 531,765

The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.

Int. Cl.³ E04B *1/82*

U.S. Cl. 181—295 **3 Claims**



1. A modular assembly, comprising:

at least two peripheral frame members, each having at least two arcuate portions;

a soft, stretchable fabric sleeve stretched over and entirely covering the peripheral frame members, the fabric resiliently forming itself into at least two major omni-directional double-curvilinear surfaces in a natural equilibrium condition; and,

the fabric sleeve being impregnated with a resinous material, thereby forming an integral, substantially rigid modular assembly together with the frame members.

4,526,251

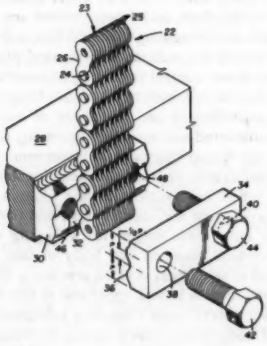
CHAIN RETENTION DEVICE

Richard J. Johannson, Dallas, Oreg., assignor to Towmotor Corporation, Mentor, Ohio

Filed Jun. 14, 1982, Ser. No. 405,137

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 R **4 Claims**



1. A material handling vehicle (10) comprising

a telescoping vertical mast (12),

a carriage (28) mounted on said mast (12),

an elongated flexible chain means (22) for moving said carriage (28) vertically on said mast (12), said chain means (22) including a plurality of pivotally interconnected and identical rigid leaves (25) defining longitudinally extending first (26) and second (24) surfaces on opposite sides of said chain said first set of leaves to define said irregular surfaces on said first set of leaves and on a portion of said second set of leaves, and

a retention assembly comprising

a rigid first member (30) secured to at least one of said mast (12) and said carriage (28),

a rigid second member (34), each of said first (30) and second (34) members having an inner surface (32/36) engaged with and conforming to the irregular surface (26/24) formed on a respective one of said first (26) and second (24) surfaces, and

fastening means (42, 44) for releasably clamping said chain means (22) between said first (30) and second (34) members to prevent longitudinal movement of said chain means (22) relative to said first (30) and second (34) members.

4,526,252

ELEVATOR HOIST UNIT

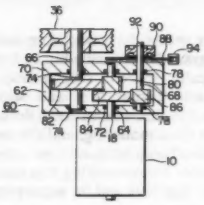
Yasutaka Hirano, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 18, 1984, Ser. No. 621,456

Claims priority, application Japan, Jun. 22, 1983, 58-96322

Int. Cl.³ B66B *11/08*

U.S. Cl. 187—20 **7 Claims**



1. An elevator hoist unit installed within a machine chamber disposed in the vicinity of a hoistway for moving an elevator car travelling along the hoistway comprising:

(a) an electric motor;

(b) a reduction gear means having a rotatable input shaft connected to said electric motor and an output shaft rotated at a reduced rate of rotation compared to said input shaft, a high speed auxiliary shaft, said reduction gear means further including a gear for increasing the rotational speed of said high speed auxiliary shaft compared to the rotational speed of said input shaft, said auxiliary shaft being connected to said gear and having an end projecting outwards from said reduction gear means;

(c) a brake wheel fixedly mounted on said projecting end of said auxiliary shaft; and

(d) braking means disposed about said brake wheel for braking or releasing said brake wheel.

4,526,253

BRAKE FOR ROLLABLE RECEIVING ELEMENTS UTILIZED PARTICULARLY IN AIRPLANES

Hubert Schmidt, Camberg, Fed. Rep. of Germany, assignor to Lerner Apparatebau GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 2, 1982, Ser. No. 446,070

Int. Cl.³ B60B *33/00*

U.S. Cl. 188—1.12 **11 Claims**

1. A braking arrangement adapted for use in connection with

a rollable cart employed in airplanes, particularly in commercial airplanes,

comprising in combination

a longitudinal base plate having relatively narrow end portions of a predetermined width,

two roller pairs mounted near opposite respective end portions on said base plate, each roller pair having a common axle, said axles being similar to one another,

at least one brake mechanism mounted on said base plate, and acting on a corresponding of said roller pairs, said brake mechanism including

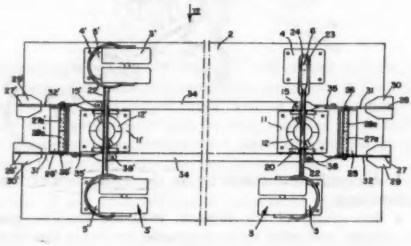
a brake rod extending over the roller pair associated therewith, and in parallel with the axle of said roller pair,

mounting means for said brake rod secured to said base plate therebelow, being located between the rollers of said roller pair, and having a recess on a lower side thereof,

a rotary disc mounted at least partly within the recess of, and concentrically with said mounting means, having a portion projecting downwardly from said mounting means, being provided with two entrainment lugs, and being movable between two extreme angular positions,

guide means for said brake rod mounted on said mounting means for restraining and lateral movement of said brake rod, while permitting a movement thereof along a substantially vertical direction,

said downwardly projecting portion having an outer surface and oppositely disposed radially extending longitudinal indentations, each bordering on one longitudinal side thereof an upright wall, and on the other side thereof a wall inclined with the vertical, each being angularly positioned so that in one angular extreme position of said rotary disc said brake rod rests on said inclined walls in a "brake released" state, while resting in the other angular position in a "brake actuated" state on said outer surface of said outwardly projecting portion,



a brake pedal downwardly actuatable within the width of an end portion of said base plate, a first lever pivotable on a shaft extending substantially in parallel with said axle, said brake pedal being secured to said first lever, and being disposed in a bracket secured to said base plate near an outer end of said base plate, and farther outwardly than said mounting means, a first tie rod pivotably connecting said first lever to one entrainment lug,

a brake-release pedal having an initial position and being downwardly actuatable within the width of said end portion of said base plate independently of said first lever, a second lever pivotable on said shaft, said brake-release pedal being secured to said second lever, a second tie rod pivotably connecting said second lever to the other entrainment lug, said tie rods being substantially stressable only in tension,

whereby each lever is operatively in contact with said brake rod,

said brake rod being formed as a crank rod near each outer end thereof,

two adjustable brake elements operatively acting on said rollers of said roller pair, respectively, and in resilient operative contact with said ends of said brake rod, respectively, and

a torsion spring mounted on said bracket, and being in operative connection with said brake-release pedal, so as to automatically enable said brake-release pedal to return to said initial position in cooperation with a stop mounted on said bracket, following each actuation of said brake-release pedal.

4,526,254

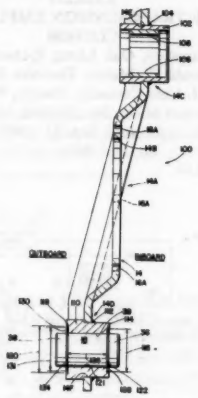
DRUM BRAKE SPIDER ASSEMBLY WITH REMOVABLE ANCHOR PIN

Gunnar Baltare, Portage, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1983, Ser. No. 506,553

Int. Cl.³ F16D *65/09*

U.S. Cl. 188—341 **9 Claims**



1. A drum brake spider assembly for expanding shoe drum brakes of the type utilizing brake shoes having a pair of generally parallel radially extending webs straddling the spider, said assembly comprising;

a spider member having a generally centrally located portion adapted for attachment to an axle housing, an actuating member mounting portion at one end thereof and an anchor pin supporting portion at the other end thereof, said anchor pin supporting portion defining a generally annular cross section anchor pin receiving bore therethrough, said anchor pin receiving bore defined by a first counterbored section having a first axial length and a first diameter adjacent the inboard end thereof, a second counterbored section having a second axial length and a second diameter at the outboard end thereof and a central section having a third diameter smaller than both of said first and second diameters extending from said first to said second counterbored sections;

a generally cylindrical anchor pin removably received in said bore, said anchor pin having a length greater than the length of said bore, said anchor pin having a first and a second annular groove about the outer periphery thereof axially spaced apart by a distance substantially equal to the axial separation of said first and second counterbored portions;

a first snap ring received in the annular groove at the inboard end of said anchor pin, said first snap ring having an axial width substantially equal to the axial width of said groove and no greater than said first axial length, said first snap ring defining a first outer diameter when received in said groove smaller than the diameter of said first counterbored section and radially outwardly resiliently expand-

able to define a second outer diameter for removal of said snap ring from said groove, said second outer diameter greater than the diameter of said first counterbored portion; and

a second snap ring received in the annular groove at the outboard end of said annular pin, said second snap ring having an axial width substantially equal to the axial width of said groove and no greater than said second axial length, said second snap ring defining a first outer diameter when received in said groove and radially outwardly resiliently expandable to a second outer diameter sufficient for removal of said snap ring from said groove, said first and second outer diameters of said second snap ring smaller than the diameter of said second counterbored portion, the first outer diameters of both of said snap rings being greater than the diameter of said central section of said anchor pin receiving bore.

4,526,255

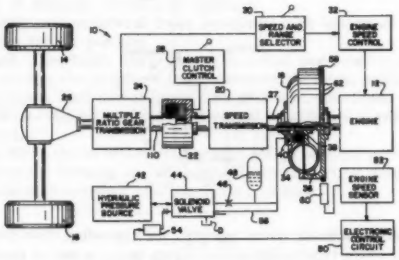
FLUID DRIVE TRANSMISSION EMPLOYING LOCKUP CLUTCH

Richard G. Hennessey, Oak Lawn; Richard B. Beemer, Lombard, and Harold W. Melles, Downers Grove, all of Ill., assignors to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 240,040, Mar. 3, 1981, Pat. No. 4,388,987. This application Sep. 27, 1982, Ser. No. 423,893

Int. Cl.[3] **B60K** *41/22*

U.S. Cl. 192—3.58 **18 Claims**



1. Power shifted composite drive to transmit multiple speeds from an uninterruptedly loaded engine shaft of an engine comprising, in combination with an operator-moved operating element (**146**) for the drive:

a speed transmission (**20**) having an input shaft (**27**), an output shaft (**104**), plural intervening gear ratio trains selectively connected to the output shaft, first means of fluid slip-drive coupling (**18**) the engine shaft to said input shaft, a second means of coupling (**29, 31**) said input shaft to said selective gear ratio trains;

a shiftable step ratio range transmission (**24**) having at least three different gear ratios to provide at least three ranges of speed and powered by a shaft thereof to be driven by said speed transmission output shaft;

third means of coupling (**22**) connecting said output shaft to the shaft of the range transmission to be driven thereby;

said first coupling comprising a power-shift lockup clutch (**38**) for the fluid slip-drive causing it to transmit engine speed to said speed transmission input shaft for two appreciably different (at least 10%) speed ratio modes of driving same from the engine, said second coupling comprising selectable high speed-torque amplifier power shift clutches (**29, 31**) to transmit input shaft speed to the selected gear ratio train with clutch-overlap action for two appreciably different (17%) speed ratio modes of driving same from the input shaft, for providing four distinctive power shift output speeds (0%, 10%, 17%, 30%) by substantial upshifts afforded by the speed transmission in driving the range transmission all in a given range, and said third coupling comprising a master clutch;

means (**94** small) including a member (**140**) operated by the operating element, and effective with fast action to engage the selected high speed clutch first;

second means (**22** large) including a member (**112**) operated by the operating element, and effective with slowed action, by timed delay, to engage the master clutch second; and

third means (**38**) including a member (**145**) operated by the operating element, and effective with further slowed action, by timed delay, to engage the lockup clutch last.

4,526,256

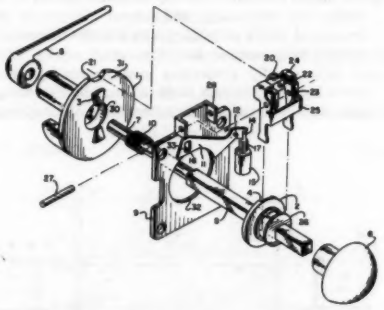
CLUTCH MECHANISM

Jan Urdal, Hayward, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Dec. 6, 1982, Ser. No. 446,967

Int. Cl.[3] **F16D** *13/22, 11/10*

U.S. Cl. 192—40 **9 Claims**



1. A clutch mechanism, for an electronic lock of the like, comprising:

a first rotary clutch element, mounted for free rotation about, and relative to, a spindle, having a first jaw element;

a second clutch element, mounted for translation along, and rotation in common with, said spindle, having a second jaw element engageable with said first jaw element for effecting rotation of one of said clutch elements in response to the rotation of the other of said clutch elements;

means interposed between said clutch elements normally restraining said clutch elements in spaced-apart disposition;

means for resiliently urging one of said clutch elements to move towards the other of said clutch elements, in response to rotation of one of said clutch elements to cause said jaw elements to engage; and

means for selectively preventing movement of said one clutch element towards said other clutch element, whereby said first and second jaw elements are prevented from effecting engagement and rotation of said one clutch element in response to rotation of said other clutch element.

4,526,257

VARIABLE SPEED ACCESSORY DRIVE

Robert S. Mueller, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 15, 1983, Ser. No. 561,751

Int. Cl.[3] **F01P** *7/02*

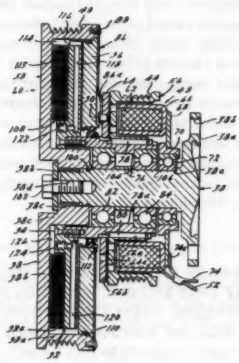
U.S. Cl. 192—48.2 **10 Claims**

10. In an engine powered vehicle, a mechanism for driving engine driven accessories at rotational speeds constant relative to engine speeds during steady-state operation of the vehicle

and at reduced speeds in response to an increased power demand of the engine, the mechanism comprising:

an input shaft driven about an axis at rotational speeds constant relative to the engine and an output drive concentric to the axis and rotatable relative to the input shaft;

a viscous coupling including a housing member fixed for rotation with the input drive about said axis and defining an annular compartment, a clutch member disposed in the compartment and mounted on the input shaft for rotation about said axis relative to said input shaft, a viscous fluid disposed. in said compartment for effecting a viscous clutching coaction between said members;



an electromagnetic clutch including a coil portion concentric to the axis and fixed against rotation, a pole portion fixed for rotation with said output drive, and an armature portion fixed for rotation with said housing member and axially moveable into engagement with said pole portion in response to an electrical signal energizing the coil;

means for reducing the amount of fluid in a working chamber portion of said compartment in response to said coil being energized; and

means for increasing the amount of fluid in the working chamber portion in response to said coil being deenergized.

4,526,258

FLUID-OPERATED CLUTCH DISENGAGING APPARATUS

Lothar Huber, Bühl-Altschweier, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

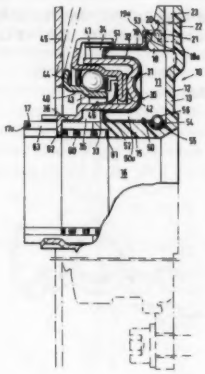
Filed Sep., 1982, Ser. No. 414,432

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136548

Int. Cl.³ F16D *23/14, 25/08*

U.S. Cl. 192—88 A **40 Claims**

1. A fluid-operated disengaging apparatus for clutches, especially for the clutches of automotive vehicles, comprising a first unit including a stationary cylinder having an open side, including an outer tubular wall and defining an annular cylinder chamber; a second unit including a hollow annular piston axially reciprocably received in said chamber and defining with said cylinder an outer annular clearance surrounded by said outer tubular wall and an inner annular clearance, said second unit further including a throw-out bearing disposed in the interior of and arranged to share the axial movements of said piston relative to said cylinder and being movable substantially radially of and within limits relative to said cylinder and said piston; an annular membrane having a median portion contacting the piston in said chamber, inner and outer marginal portions secured to said first unit, and first and second annular corrugations respectively located in said outer and inner clearances; guide means provided on at least one of said units to hold said piston against radial movement relative to said cylinder, said guide means comprising an inner tubular wall forming part of said first unit and disposed radially inwardly of said



chamber and follower means provided on said piston and movable only axially of said inner tubular wall; and a seal provided in said outer clearance between the open side of said cylinder and said first corrugation.

4,526,259

HYDRAULICALLY OPERABLE RELEASE ARRANGEMENT

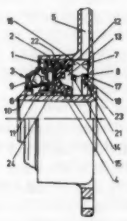
Manfred Brandenstein, Eussenheim; Lothar Walter, Schweinfurt, and Heinz Kiener, Waigolshausen, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,293

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145363

Int. Cl.³ F16D *23/14, 25/08*

U.S. Cl. 192—91 A **7 Claims**



1. In an hydraulically operable clutch release wherein a piston is moveable in a cylinder to transmit movement thereon to a clutch release bearing, the cylinder being formed in a housing which defines a chamber on one side of the piston for receiving an hydraulic fluid; the improvement comprising a helical spring extending between said housing and piston for resiliently biasing said piston toward said clutch release bearing, means for radially holding said spring with respect to said piston and housing, said spring having end faces, and projections extending axially from said housing and piston to circumferentially engage the respective said end faces of said spring, whereby rotation of said piston with respect to said housing is inhibited.

4,526,260
TORQUE TRANSMISSION DEVICE

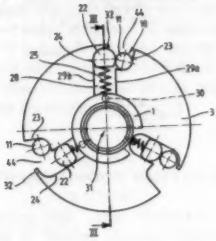
Bernhard Schierling, Unterpleichfeld, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 6, 1982, Ser. No. 406,059

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1981, 3132045

Int. Cl.³ F16D *3/14*

U.S. Cl. 192—106.2 **12 Claims**



1. In a torque transmission device particularly for a clutch disc unit to be used in a clutch assembly of an internal combustion engine comprising:

a hub member rotatable about an axis;

a torque input member mounted on said hub member for angular movement with respect to said hub member about said axis;

a main damping unit and an idling damping unit both in torque transmitting arrangement between said torque input member and said hub member;

said main damping unit comprising a main damper input unit, a main damper output unit, both said input unit and said output unit being mounted on said hub member for angular movement about said axis, first elastic support means in torque transmitting arrangement between said main damper input unit and said main damper output unit, and first frictional damping means arranged for damping relative angular movement of said main damper input unit and said main damper output unit about said axis; said idling damper unit comprising an idling damper input unit being mounted on said hub member for angular movement about said axis, an idling damper output unit, second elastic support means in torque transmitting arrangement between said idling damper input unit and said idling damper output unit, and second frictional damping means arranged for damping relative angular movement of said idling damper input unit and said idling damper output unit;

said main damper input unit being connected for common angular movement with said torque input member;

said idling damper output unit being connected for common rotation with said hub member;

said idling damper input unit being connected for common angular movement with one of said main damper input unit and said main damper output unit;

centrifugal mass-controlled locking means being provided for locking the angular movement of said main damper output unit with respect to said hub member;

the improvement comprising:

angular movement limiting means being provided between said main damper output unit and said hub member such as to allow a limited angular relative movement of said main damper output unit and said hub member, said centrifugal mass-controlled locking means cooperating with said angular movement limiting means such as to selectively allow or lock said limited angular relative movement in response to the velocity of rotation of said hub member, said angular movement limiting means comprise first and second abutment members mounted for common angular movement with one of said hub member and said main damper output unit and having an angular distance about said axis, and a third abutment member mounted for common angular movement with the other of said hub member and said main damper output unit, said third abutment member being positioned angularly between said first and second abutment members and having an angular extent smaller than said angular distance of said first and second abutments members, said centrifugal mass-controlled locking means comprising a locking member for engagement between said third abutment member and one of said first and second abutment members, said locking member having an angular extent substantially corresponding to the difference between said angular distance of said first and second abutment members and said angular extent of said third abutment member, said locking member being spring-biased towards a disengagement position radially offset with respect to said abutment members and being movable by centrifugal force into a locking position between said third abutment member and said one of said first and second abutment members, said first and second abutment members are provided on a hub disc member mounted for common rotation with said hub member, and said locking member is substantially radially guided on said hub disc member.

4,526,261
CLUTCH PLATE WITH CONTROL MEANS AND AT LEAST TWO ENERGY STORING DEVICES COOPERATING WITH THE CONTROL MEANS

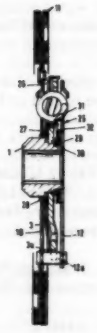
Peter Maier, Bühl, and Kurt Frietsch, Bühlertal, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Aug. 12, 1982, Ser. No. 407,585

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147237

Int. Cl.³ F16D *3/14, 3/66*

U.S. Cl. 192—106.2 **35 Claims**

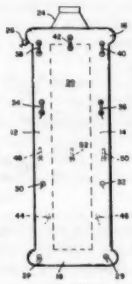


1. A clutch plate, especially for use in clutches, comprising a first component; a second component rotatable within limits with reference to said first component; and means for yieldably opposing rotation of said second component with reference to said first component, including a friction generating unit having control means and being arranged to oppose rotation of said second component during a second stage which follows a first stage of such rotation, and at least two energy storing devices acting between said control means and at least one of said components, one of said devices being arranged to cooperate with said control means in opposing rotation of said second component during a first and a subsequent second portion and the other of said devices being arranged to cooperate with said control means in opposing rotation of said second component only during said subsequent second portion of said second stage.

4,526,262
INFLATABLE EVACUATION SLIDE

Bruce Malcolm, Kent, Wash., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 9, 1982, Ser. No. 386,832
Int. Cl.³ B65G *11/10*
U.S. Cl. 193—25 B **25 Claims**



1. Inflatable slide apparatus for evacuation from an elevated egress to a lower surface, comprising:

a fluid distensible member of a generally elongate configuration when fully inflated disposed in an uninflated folded configuration at the elevated egress with one end secured thereto; and

means to restrain said fluid distensible member in a folded configuration during inflation thereof,

said restraint means including three separate restraints across the width of said fluid distensible member, each restaint including, a first portion affixed to the upper surface of said fluid distensible member, a second portion affixed to the underside of said fluid distensible member, and a releasable link joining the first portion with the second portion of each restraint, said releasable link responsive to muscle forces generated by the pressurization of said member, and means to isolate each releasable link from random transient deployment forces,

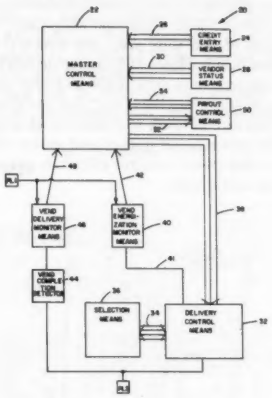
at least one of the releasable links having a release point at least 10% higher than the other two releasable links of said restraint means to deploy the fluid distensible member from said elevated egress in a directional manner.

4,526,263
LOCK-AHEAD VEND CONTROL EMPLOYING A COMMON VEND ENERGIZATION MONITOR TO EFFECT VEND SELECTION RECOGNITION FOR VENDING

Joseph L. Levasseur, Chesterfield, Mo., assignor to H. R. Electronics Company, St. Louis, Mo.

Filed Jun. 16, 1983, Ser. No. 504,887
Int. Cl.³ G07F *5/16*
U.S. Cl. 194—1 N **60 Claims**

1. A vend control circuit for use in a vending system for vending a plurality of vend selections at least some of which may be differently priced from one another, each differently priced vend selection defining a distinct vend channel, each vend channel having a pre-established vend price and at least one vend selection associated therewith, the vending system having delivery control means including a plurality of vend delivery means, each vend selection having a vend delivery means associated therewith, means for supplying power to the vend delivery means, and selection means for selecting from among the plurality of possible vends, the selection means being operatively connected to the delivery control means and actuatable to enable communication to the delivery control means of selection information identifying the vend selection selected, the delivery control means effecting energization of the vend delivery means associated with a vend selection selected when, during the time that selection information identifying the particular vend selection selected is communicated to the delivery control means, a vend is authorized for the vend channel that has associated therewith the particular vend selection selected, the vend control circuit comprising credit entry means for receiving credit entries and for generating credit information signals, master control means operatively connected to the credit entry means to receive tne credit information signals therefrom and to accumulate total credit entered, said master control means operable to sequentially compare total credit entered against the vend price associated with each respective vend channel and to produce a respective vend channel authorization signal if the total credit entered at least



equals the vend price associated with such vend channel, means for communicating vend channel authorization signals to the delivery control means, vend energization monitor means for detecting the energization of any vend delivery means and for producing a vend energized output signal in response thereto, and means for communicating the vend energized output signal to the master control means, the master control means being responsive to the vend energized output signal to inhibit further comparison by the master control means of total credit entered against the vend price associated with each respective vend channel and to maintain the production of the vend channel authorization signal then being produced for a sufficiently long enough period to permit the vend delivery means that has been energized to operate.

4,526,264
ELECTRICALLY OPERATED CARD DISPENSER

Barry A. MacNamara, and John H. Garde, both of 861 Ann St., Fortitude Valley, Brisbane, Queensland, Australia

Filed Mar. 30, 1984, Ser. No. 595,301
Int. Cl.³ G07F *5/16*
U.S. Cl. 194—1 N **9 Claims**

1. A coin-operated card dispensing system comprising, in combination:

a coin acceptor, which is adapted for receiving one or more coins from a customer and which produces one or more coin output signals representative of the value of the coins received from the customer;

a coin register which receives said coin output signals and stores a coin value signal representative of the value of the coins received from the customer;

a power pulse generator activated by a non-zero status of said coin value signal;

a card stack module comprising a plurality of card stacks, each of which said card stacks is associated with a card driver unit that comprises:

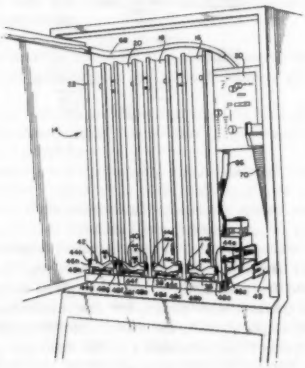
a motor having a power input port adapted to receive power pulses from said power pulse generator;

a gear device which is coupled to said motor and which increases the torque and decreases the units of angular rotation delivered by said motor, said gear device having an output shaft;

an eccentric unit which is coupled to said output shaft and which converts the rotary motion of said motor and said gear device to a longitudinal motion;

a slide plate which is coupled to said eccentric unit and which is longitudinally driven by said eccentric unit back and forth between a first position and a second position; and

a power delivery circuit having a power delivery control means that causes said power delivery circuit to be in an open circuit state when said slide plate is at said first position of said slide plate and which power delivery control means causes said power delivery circuit to be in a closed circuit state when said slide plate longitudinally moves away from said first position, said power delivery circuit being so connected as to deliver power to said power input port of said motor when and only when said power control circuit is caused to be in a closed circuit state;



and each of which said card stacks contains a substantially vertical stack of substantially horizontally disposed cards, the bottommost card being positioned to be driven out of said card stack for delivery to the customer by the longitudinal motion of said slide plate to said second position;

pulse duration control means for controlling the duration of said power pulses to be

(1) at least as long as the time it takes for said slide plate to be driven

(a) from said first position where said slide plate causes said power delivery circuit to be in an open circuit state,

(b) to a position sufficiently displaced therefrom so that said power delivery control means causes said power delivery circuit to be in a closed circuit state, but

(2) not substantially longer than the time it takes for said slide plate to traverse a complete longitudinal cycle from said first to said second to said first position;

means for decrementing by 1 card equivalent said coin value signal stored in said coin register, for each time that a said slide plate of a said card driver unit traverses a complete cycle and delivers a card; and

power pulse direction means for directing each said power pulse to a said power input port of said motor of one of said card driver units.

4,526,265

LARGE CONVEYOR ASSEMBLIES FOR DETACHABLE MOUNTING TO A TRACTOR

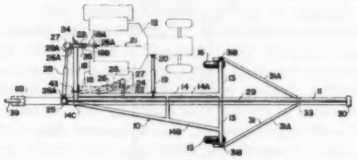
Silvanus T. Enns, 14-224 Kennedy St., Winnipeg, Manitoba, Canada R3C 1T1

Filed Mar. 21, 1983, Ser. No. 477,163

Claims priority, application Canada, Apr. 16, 1982, 401159

Int. Cl.³ B65G *41/00*

U.S. Cl. 198—318 **24 Claims**



1. A transportable auger for mounting to a tractor including a hitch and a PTO at a rear position thereon; said auger including in combination a freestanding undercarriage including a frame, a pair of spaced apart front, ground engaging castor wheel assemblies mounted in said frame, a ground wheel directionally fixed to said frame to support the rear of said frame, means for detachably and adjustably securing the undercarriage to the hitch of said tractor, means for interconnecting the frame to said tractor at a position forwardly of said hitch and rearwardly of said front wheels whereby the tractor and undercarriage when connected are in side by side relationship, an auger tube having an inlet end and a discharge end and means for mounting said auger tube on said undercarriage with said discharge end forward of said front wheels, means for raising and lowering said inlet end, means for raising said forward discharge end from a transport position to various working positions and vice-versa and a telescopic drive shaft for communicating drive from said PTO to said auger.

4,526,266

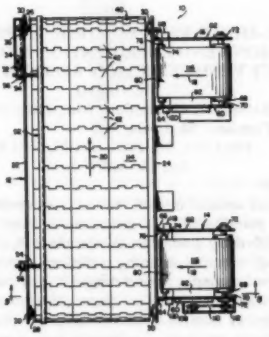
DUAL-T TRANSFER CONVEYOR

Keith A. Dietz, Dallas, Tex., assignor to Stewart Engineering & Equipment Co., Inc., Plano, Tex.

Filed Aug. 11, 1982, Ser. No. 407,046

Int. Cl.³ B65G *15/58, 37/00, 47/26*

U.S. Cl. 198—357 **7 Claims**



1. A conveyor system comprising:

a cross conveyor for transporting articles in a first predetermined direction and comprising a continuous conveying surface of predetermined length formed from a relatively low friction material which defines a conveying plane and article supporting surface positioned at a first predetermined elevation;

at least one input conveyor for transporting articles in a second predetermined direction which is substantially perpendicular to the first predetermined direction and positioned to insert articles onto the conveying surface of the cross conveyor for transportation thereby;

the input conveyor comprising a conveying surface formed from a relatively high friction material defining a conveying plane positioned at a second predetermined elevation which is higher than the first predetermined elevation of the conveying plane of the cross conveyor;

the input conveyor having a discharge end positioned to discharge articles conveyed thereby directly onto the cross conveyor;

the cross conveyor being driven continuously as the input conveyor inserts articles onto the conveying surface of the cross conveyor, the relatively low friction material of the cross conveyor facilitating the transfer of articles from the input conveyors by reducing frictional forces that cause skewing of the articles during their discharge onto the cross conveyor; and

magnet means for magnetically attracting and maintaining the trailing end of each article conveyed by the input conveyor in contact with the conveying surface thereof as the leading end of the article is extended over the conveying surface of the cross conveyor.

4,526,267

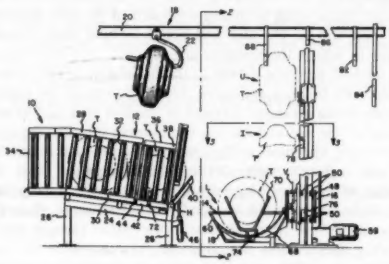
METHOD AND APPARATUS FOR STORING AND TRANSFERRING TIRES TO A HOOK CONVEYOR

Antony Harding, Schieren, Luxembourg, and Roger Marthoz, Fouches, Belgium, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 12, 1982, Ser. No. 440,750

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—409 **7 Claims**



1. Apparatus for storing, transferring and aligning tires to continuously movable hooks along the path of a hook conveyor from a position spaced from and below said conveyor comprising a tire carrier having a basket member, a chute having an inclined supporting surface extending from an entrance end to an exit end, gate means for retaining and releasing the tires located at said exit end, said gate means being rotatable about a generally horizontal axis for lowering at least one of said tires into said basket member, said tire carrier being movable vertically along a vertical mast member between a lower position adjacent and below said exit end of said chute for receiving said tires in said basket member and an upper position with said basket member in the path of said hook conveyor for transferring said tires to said hook conveyor, power means for raising and lowering said carrier between said lower position and said upper position, means for rotating said basket member about a vertical axis a predetermined amount to move said tires in said upper position into alignment with the path of said hook conveyor for movement of one of said movable hooks of said conveyor into the central aperture of one of said tires for engagement with one side of the sidewall to move said tire out of said basket member, said carrier comprising a slide member slidably mounted on said mast member for vertical movement and said basket member being pivotally connected to said slide member for rotational movement of said basket member about a vertical axis, cam means for rotating said basket member in one direction and resilient means for rotating said basket member in the opposite direction.

4,526,268

APPARATUS FOR ASSEMBLING ARRAYS OF CIGARETTES OR THE LIKE

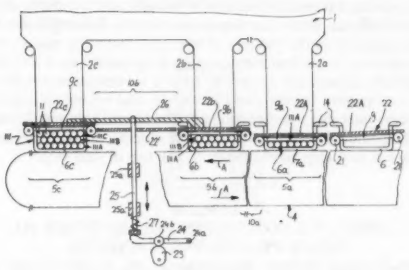
Gottfried Hoffmann, Schwarzenbek; Reinhard Deutsch, Geesthacht, and Klaus-Jürgen Pohl, Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,569

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3207954

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—419 **13 Claims**

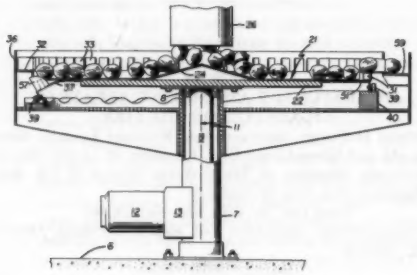


1. Apparatus for assembling arrays of overlapping layers of parallel cigarettes or analogous rod-shaped articles, comprising a conveyor movable intermittently in a predetermined direction along a predetermined path and including a plurality of equidistant variable-capacity receptacles for arrays, said receptacles having movable walls and each receptacle further having a second wall which is at least substantially parallel to the respective movable wall; a magazine adjacent to a portion of said path and including several outlets each having means for accumulating successive layers of parallel articles and an opening for evacuation of successively accumulated layers, each of said openings being in register with a receptacle during each interval of dwell of the conveyor and the spacing between the openings of said outlets matching the spacing between the receptacles of said conveyor, as considered in said direction; means for transferring the layers from the outlets of said magazine into the registering receptacles during successive intervals of dwell of the conveyor, the width of each of said openings, as considered in said direction, at least approximating the width of layers which are accumulated in the respective outlets; and means for varying the capacity of said receptacles so that each receptacle which registers with an opening provides room only for reception of the respective layer and the receptacles advancing between and beyond said openings are at least substantially filled to capacity, said varying means including means for moving the movable walls of successive receptacles between different positions to thereby vary the volumes of the respective receptacles, said moving means including means for yieldably urging said movable walls at right angles to and away from the respective second walls.

4,526,269
SINGULATOR

Jerald M. Henderson, Davis, and Burford J. Furman, San Jose, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 20, 1983, Ser. No. 505,839
Int. Cl.³ B65G *47/12*
U.S. Cl. 198—443 **7 Claims**

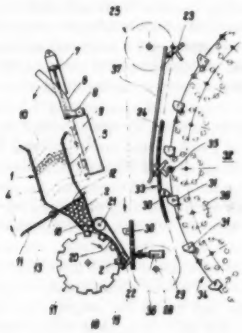


1. A singulator for similar objects in miscellaneous array comprising a turntable, means for rotating said turntable about a vertical axis, means for depositing objects for singulation on said turntable in the vicinity of said axis, means on said turntable defining a vertical step extending upwardly near and substantially around the periphery of said turntable, means defining an opening through said turntable, and means including a plunger movable in a direction parallel to said axis and through said opening for lifting one of said objects on said turntable adjacent said step substantially to the top of said step.

4,526,270
APPLIANCE FOR FEEDING GLASS TUBES TO GLASS-PROCESSING MACHINES

Hans-Joachim Dichter, Sachsendamm 93, D-1000 Berlin 62, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,220
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3212228
Int. Cl.³ B65G *47/12*
U.S. Cl. 198—453 **14 Claims**

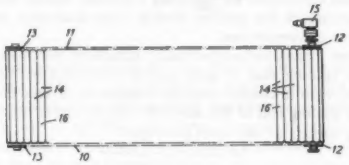


1. Appliance for feeding glass tubes to glass-processing machines, from a glass-tube magazine (1) which receives a bundle of glass tubes (2) and which possesses an exit opening (16) to which a unit (17) for separating the glass tubes (2) is assigned, wherein the separating unit (17) serves to transfer individual glass tubes from the glass-tube magazine (1) into the gripping zone of feeding tongs (23) which are mounted on an endless conveyor (25) serving the function of feeding the glass tubes to the glass-processing machine (32), said endless conveyor (25) possessing two conveying chains (24) which are arranged one above the other, and said endless conveyor being fitted with stops (30) engaged by driving dogs (31) on the glass-processing machine (32).

4,526,271
SLAT CONVEYOR

Francis M. Finnighan, Peterborough, Canada, assignor to Alfa-Laval Cheese Systems Limited, Somerset, England

Filed Jun. 28, 1982, Ser. No. 392,692
Claims priority, application United Kingdom, Jul. 1, 1981, 8120355
Int. Cl.³ B65G *47/84*
U.S. Cl. 198—648 **10 Claims**



1. A slat conveyor comprising a pair of endless chains mounted on guide means for improvement along parallel tracks, each chain comprising links pivotally connected to one another by transverse spindles, a plurality of transverse slats mounted on and extending between the chains, and securing means attaching the ends of the slats to separate links respectively of the associated chains, wherein the link attached by said securing means to one end of each slat is fitted with transverse spindles of the associated chain, the adjacent links of the associated chain being arranged outboard of the link attached to said one end of the slat and being formed with bearing apertures in which the spindles are engaged, and the link attached by said securing means to the other end of each slat is provided with bearing apertures, adjacent links of the associated chain being arranged inboard of the link attached to said other end of the slat and having tranasverse spindles engaged in said bearing apertures in the link attached to said other end of the slat, whereby each slat can be disengaged from the remainder of the chains by withdrawing the slat axially in a direction away from said one end thereof so as to slide the spindles on the link attached to said one end of the slat out of the bearing apertures in the adjacent links and slide the link attached to said other end of the slat off the spindles on the adjacent links.

4,526,272
LATERALLY BENDABLE BELT CONVEYOR

William J. Peterson, Coraopolis, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

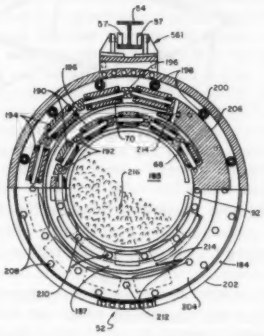
Filed Sep. 24, 1982, Ser. No. 422,796
Int. Cl.³ B65G *21/10*
U.S. Cl. 198—819 **11 Claims**

1. A movable conveyor system for continuously transporting solid particulate material along a curved path, said system comprising:

an endless, laterally flexible conveyor belt having substantially more resistance against longitudinal tension in the center portion thereof than in the marginal portions thereof, said belt including a transport length and a return length;

a plurality of adjustable support means for supporting and shaping the transport and return lengths of said belt, each of said support means including inner transport means for engaging the conveyor belt surface along its transport

length to permit the longitudinal displacement thereof in a first, inner supported troughing configuration, outer transport means for engaging the belt surface along its return length to permit the longitudinal displacement thereof in a second direction opposite to said first direction and in a second, outer supported troughing configuration, and rotational support means aligned and cooperating with said inner and outer transport means to permit at least 90° rotation of the transport and return length of said conveyor belt about the longitudinal axis thereof along a curved path of said conveyor system, said adjustable



support means supports the inner transport means and the outer transport means along with their engaged belt lengths in a substantially concentric belt troughing configuration for rotation about the longitudinal axis of the transport length of the belt; and

drive and idler means for longitudinally displacing said conveyor belt and applying sufficient tension differentially across the width of said belt for supporting the particulate material thereon between adjacent support means and for rotationally displacing the center portion of said conveyor belt towards the inner circumference of lateral bends along the said curved path.

4,526,273
PORTABLE COSMETICS CASE

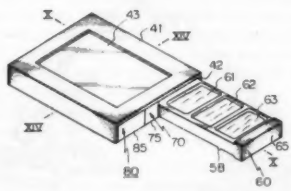
Hiroshi Tsuji, Kanagawa, and Hirofumi Katada, Tokyo, both of Japan, assignors to POLA Chemical Industries, Inc., Shizuoka, Japan

Filed Nov. 21, 1983, Ser. No. 555,003

Claims priority, application Japan, Nov. 24, 1982, 57-177539[U]

Int. Cl.³ A45D *33/28, 40/24;* B65D *61/00*

U.S. Cl. 206—229 **5 Claims**



1. A portable cosmetics case comprising:

a flat box-like hollow case body defining therein an accommodation space and having a rectangular cross-section with the width being an integer multiple of a unit width and the height being a predetermined height, said accommodation space having an opening at one end and having a width of at least five unit widths;

a plurality of cosmetic containers removably received respectively through the opening into the accommodation space;

said plurality of cosmetic containers filling up the accomodation space and being selected from among the following items:

(a) a first cosmetic container on which is mounted one of a lip stick, a painting pencil, a painting stick, and the like at one end and having a width equal to one unit width,

(b) a second cosmetic container of upwardly opening boxlike shape containing one or more cosmetics, a cosmetic brush, and the like, and having a width of two unit widths, and

(c) a third cosmetic container of upwardly opening boxlike shape containing one or more cosmetics and having a width being equal to three unit widths.

4,526,274
FEEDING TEAT, OPENING INSTRUMENT AND HOLDER

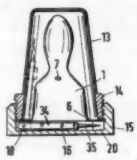
Lutz Kesselring, and Horst Frödrich, both of Zeven, Fed. Rep. of Germany, assignors to MAPA GmbH Gummi-und Plastikwerke, Zeven, Fed. Rep. of Germany

Filed Aug. 23, 1983, Ser. No. 525,750

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1982, 3231381

Int. Cl.³ A61J *9/00*

U.S. Cl. 206—231 **12 Claims**



1. An assembly comprising a feeding teat, an opening instrument, and a holder for said feeding teat and said opening instrument,

said feeding teat comprising a tip portion, which is formed on the outside with a recess that is substantially wedge-shaped in cross-section and closed from the interior of the teat and constitutes means for guiding said opening instrument,

said holder comprising first retaining means for detachably retaining said teat on said holder and second retaining means for detachably retaining said opening instrument on said holder.

4,526,275
TRANSMISSION SEALING APPARATUS

David A. Nixon, 209 Jug Broome Rd., Monroe, N.C. 28110

Filed Jun. 4, 1984, Ser. No. 617,024

Int. Cl.³ B25B *11/00*

U.S. Cl. 206—231 **11 Claims**

1. A seal kit for preventing the loss of transmission fluid when servicing an automatic transmission of the type used in a vehicle having a drive shaft and a bell housing, said transmission including:

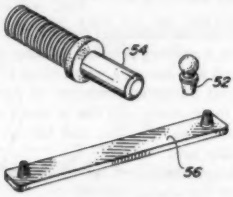
(i) a first aperture through which a dipstick may be inserted,

(ii) a second aperture in a rearward end of said transmission when said rearward end is disconnected from said drive shaft, and

(iii) a torque converter which is free to fall from a forward end of said transmission when said forward end is disconnected from said bell housing, said seal kit comprising:

a first plug for sealing said first aperture to prevent the loss of transmission fluid therefrom;

a second plug for sealing said second aperture when said transmission is disconnected from said drive shaft; and



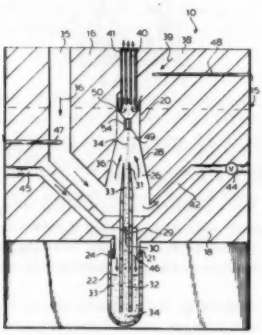
restraining means for coupling across said forward end when said transmission is disconnected from said bell housing to secure said torque converter.

4,526,276

APPARATUS AND METHOD FOR SORTING PARTICLES BY GAS ACTUATION

Bernard A. Shoor, Atherton, and Mack J. Fulwyler, Sunnyvale, both of Calif., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Apr. 28, 1983, Ser. No. 489,667
Int. Cl.³ B07C 5/34, 5/36
U.S. Cl. 209—552 **17 Claims**



1. An apparatus for sorting particles moving in a liquid stream according to differences in particle parameters comprising:

means for providing a stream of particles in a liquid flow;

means for analyzing said particles as they are flowing to detect particles having different parameters;

a hollow inner tube and a concentrically arranged hollow outer tube located downstream of said analyzing means, said inner and said outer tubes having substantially concentric particle exit ends separated by an annular space, said inner tube having its longitudinal axis aligned substantially with said stream of particles;

means for generating gas bubbles in said inner tube to prevent particles from flowing therein and to deflect flowing particles into the annular space between said inner and outer tubes; and

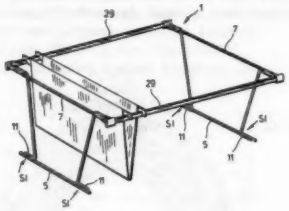
means for coordinating the generation of gas bubbles with said particle analysis to selectively deflect particles having said different parameters into said annular space whereby the particles are sorted for collection from the exit ends of said tubes.

4,526,277

HANGING FOLDER FRAME SUPPORT

Wesley R. Snowden, Etobicoke, and Erhard P. Walter, Brampton, both of Canada, assignors to Corvent International Limited, Brampton, Canada

Filed Sep. 12, 1983, Ser. No. 531,008
Int. Cl.³ A47F 7/16
U.S. Cl. 211—46 **15 Claims**



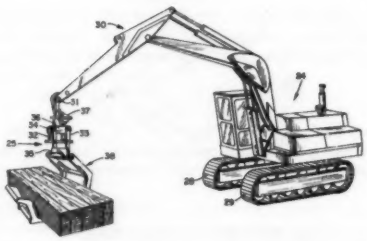
1. An arrangement comprising a pair of invertible frame members in combination with a single pair of side rails for hanging of hanging folders from the side rails and connecting members for connecting the side rails to said frame members, each said frame member being free of moving parts and when upright, having vertically spaced ends with a first pair of horizontally spaced supports at one of said ends and a second pair of horizontally spaced supports of different spacing from said first pair of supports at the other of said ends, said connecting members being removeable from said frame member for fitting at either of said first and second pairs of supports, each said frame member being of fixed configuration to provide for preset spaced support of the side rails by said first pair of horizontally spaced supports with the connecting members fitted on said first pair of supports in a first spaced relation in one upright orientation of the frame member and to provide for preset spaced support of the side rails by said second pair of horizontally spaced supports with the connecting members fitted on said second pair of supports in a second spaced relation different from the first spaced relation when the frame member is inverted.

4,526,278

BOARD ROAD BUNDLE CRADLE

Francis A. Hebert, Shriever, La., assignor to South Louisiana Contractors Inc., Lafayette, La.

Filed Jun. 13, 1983, Ser. No. 503,893
Int. Cl.³ B66C 23/06
U.S. Cl. 212—242 **1 Claim**



1. An apparatus for laying board roads for use with the free end of a dip stick having a pivoted work carrier at its free end which has a horizontally rotatable work carrier comprising

a board bundle cradle hook adapted to be carried by said work carrier, being of U-shape having upwardly turned

flat portions spaced apart and having laterally spaced side edges, and a board bundle cradle comprising

a pair of spaced apart end frames secured together by a plurality of tubular spacers,

each of said end frames having a base member adapted to receive and support a bundle of boards to be laid into a board road,

a major and minor board bundle containment member upstanding from each end base member,

an upper forwardly inclined member extending from the upper portion of each major support member,

the portion lying between said upwardly forwardly inclined member and the upper free end of said minor board bundle containment member defining the mouth of the cradle through which a bundle of boards to be laid are introduced to and withdrawn from said cradle,

the spacer between the upwardly forwardly inclined members being adapted to be carried in the U-shape flat member of said hook carried by said horizontally rotatable work carrier for rotating the cradle containing a board bundle alternately ninety degrees for presenting the boards for withdrawl from said cradle and laying both longitudinally and transversely of the direction of the board road to be laid.

4,526,279

SEVERING OVERCAP FOR CONTAINER

Gerhard H. Weiler, South Barrington, and Louis T. Pagels, Hanover Park, both of Ill., assignors to Automatic Liquid Packaging, Inc., Arlington Heights, Ill.

Filed Oct. 6, 1983, Ser. No. 539,576
Int. Cl.³ B65D *1/02*
U.S. Cl. 215—32 **16 Claims**

1. An overcap for use wth a hermetically sealed container wherein said container includes a hollow body portion; a neck portion unitary with said body portion and having an external thread on a generally cylindrical peripheral surface; a cover portion closing said neck portion; and a severable frangible web joining said cover portion to said neck portion as a unitary structure and defining a line of weakness between said neck portion and said cover portion; said overcap comprising:

an elongate hollow body having a closed end and an open end, said body having a generally cylindrical peripheral wall oriented about a longitudinal axis;

an internal thread on the interior of said overcap along said peripheral wall for engaging said neck portion external thread; and

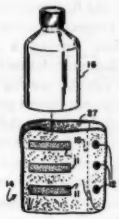
a plurality of flexible fingers on the interior of said overcap body extending from said peripheral wall between said internal thread and said closed end, each said finger projecting inwardly toward said longitudinal axis and toward said closed end whereby, when said overcap is screwed onto said container neck portion, each said finger is temporarily deflected outwardly as it is carried past at least a part of said cover portion after which it assumes a rest position so that said overcap is operable upon rotation in the unscrewing direction to exert through said fingers an axial force away from said container body portion and against said cover portion to fracture said line of weakness for removal of said cover portion.

4,526,280

BOTTLE COVER

Sharon E. Taylor, 604 W. Market St., Germantown, Ohio 45327

Filed Aug. 13, 1984, Ser. No. 639,753
Int. Cl.³ B65D *65/10, 23/08;* A47G *23/02*
U.S. Cl. 215—100.5 **12 Claims**



1. A bottle cover comprising:

an absorbent cloth pouch which is open on one side for reception of a bottle,

a first patch of hook and loop fastening material attached to the outer surface of said pouch, and

a second patch of hook and loop fastening material attached to the outer surface of said pouch in spaced relation to said first patch such that said pouch may be folded along a line generally perpendicular to said open side for confining a container therein;

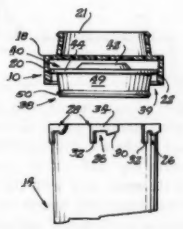
said first and second patches of hook and loop material being mutually fastenable.

4,526,281

MOISTURE TIGHT CLOSURE AND CONTAINER

James E. Herr, East Petersburg, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.

Filed Aug. 9, 1984, Ser. No. 639,031
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—211 **6 Claims**



1. A closure and container having a moisture tight sealing engagement with each other, said closure having both a child-resistant and non-child resistant portion, comprising:

a container having a side wall, an upper end with an open mouth over which said closure is received, and locking members on said container adjacent said upper end;

an interior wall on said side wall of said container having detent projections extending inwardly into the hollow interior of the container, the ends of the detent projections being spaced from one another in a circumferential direction to define spaces between adjacent projections;

a closure having a top wall adapted to extend across the mouth of said container having a first sealing plug depending there-

from, said first sealing plug being within a skirt wall depending from said top wall and having a depending wall for insertion into said open mouth of said container, said skirt wall having locking members thereon to interlock with the locking members on the container to secure said closure to said container in a child-resistant manner;

a second sealing plug integral with said top wall and having a depending wall for insertion into said open mouth of said container, said second sealing plug extending from said top wall on the side opposite said first sealing plug to secure said closure to said container in a non-child resistant manner; and

said depending walls of said first and second sealing plugs each having an outwardly projecting annular sealing surface, said annular sealing surface having a diameter substantially larger than an inner diameter defined by said detent projections, portions of said annular sealing surface expanding into the spaces between adjacent detent projections as the sealing surface is being pushed down past the projections or is being pulled upwardly past the projections, said sealing surface extending below said container mouth to engage said interior wall below said projections so as to provide a moisture tight sealing engagement of said closure with said container, said projections holding the closure on said container.

4,526,282

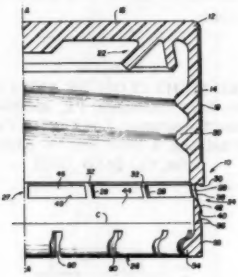
TAMPER PROOF CLOSURE CAP, METHOD, AND TOOL FOR MAKING SAME

Herbert V. Dutt, and Paul A. Santostasi, both of Sarasota, Fla., assignors to Sun Coast Plastics, Inc., Sarasota, Fla.

Continuation of Ser. No. 491,673, May 5, 1983, abandoned. This application Jan. 5, 1984, Ser. No. 567,077

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—252 **3 Claims**



1. A unitary, molded closure cap capable of being applied to a container to provide tamper-proof security without heat shrinking, comprising a substantially rigid outer closure member having a transverse top wall and a cylindrical side wall, integrally formed at its upper end with the perimeter of said transverse top wall and depending therefrom, the lower end of said side wall defining an open end of said outer closure member, said closure member being adapted to receive the mouth and neck of a container, said side wall having a first outer diameter;

a resilient inner sealing member secured to the inner surface of said transverse top wall and adapted to engage and seal the mouth of a container;

an annular skirt portion connected to the lower end of said side wall to form an extension of said side wall and having an outer surface with a diameter no greater than said first outer diameter, said skirt portion, including;

(a) a lower security ring portion and an upper rib portion connecting said security ring to the lower edge of said side wall, said security ring protion having an outer surface having a diameter substantially equal to said first diameter;

(b) an inwardly facing annular bead formed at the lower end of said security ring portion;

(c) a first inwardly and upwardly tapering portion formed on the outer surface of said security ring portion defining a downwardly facing first annular shoulder extending diametrically inwardly from said outer surface of said security ring portion above said annular bead and below said upper rib portion;

(d) a curved exterior surface portion formed on the outer surface of said security ring extending upwardly and inwardly from said first annular shoulder to the inner surface of said security ring portion at its junction with said upper rib portion to define an upper edge for said security ring portion, said upper edge being spaced below said lower end of said side wall;

(e) said upper rib portion comprising a plurality of spaced inwardly tapered ribs extending between said upper edge of said security ring portion and the inner peripheral edge of said lower end of said side wall; and

wherein said lower edge of said side wall comprises a second annular shoulder extending diametrically inwardly from the outer surface if said closure member, said first and second annular shoulders serving as spaced mold engaging surfaces to protect said ribs during removal of a completed molded closure cap from a forming mold.

4,526,283

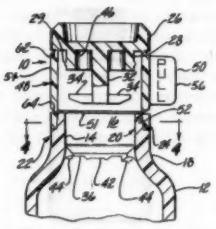
PACKAGE CLOSURE

Robert A. Skinner, 1544 Thistledown, Apt. 2D, Okemos, Mich. 48864

Filed Aug. 22, 1983, Ser. No. 524,879

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—256 **15 Claims**



1. A container closure comprising:

a stopper member having stopper means and means engageable with said container for fastening said stopper means to said container; and

frangible means for attaching said stopper member to said container in a position whereat said fastening means is not engaged with said container, said frangible attaching means comprising a detachable skirt extending between said container and said stopper member, said skirt being radially outwardly spaced from said stopper means.

4,526,284

PLASTIC CLOSURE WITH SEALING FIN

James F. Herbert, Cheslyn Hay, England, assignor to Metal Closures Limited, West Midlands, England

Filed Sep. 7, 1984, Ser. No. 648,029

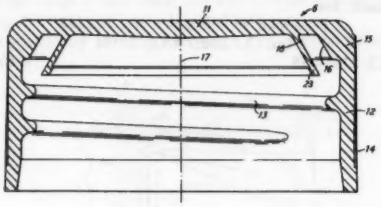
Claims priority, application United Kingdom, Oct. 19, 1983, 8327991

Int. Cl.³ B65D *53/00*

U.S. Cl. 215—329 **7 Claims**

1. A container closure moulded in one piece from a plastics material and comprising a top, a circumferentially extending skirt depending from the top and having a radially inner sur-

face formed with a screw-thread, a surface which is flared in a direction away from the top being formed on the internal surface of the skirt where it joins the top, and an annular resiliently flexible fin extending from the underside of the top at a position spaced radially inwardly of said flared surface, said fin having a main body which has an increasing diameter in a



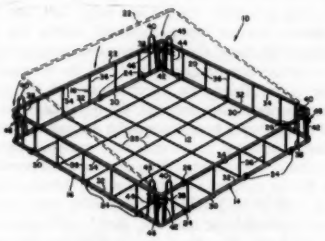
direction away from the top and having a free end portion which is thicker than said main body, said fin having a length such as to permit at least its portion adjoining said free end to lie against said flared surface when the fin is deformed outwardly by the top of the neck of a container to which the closure is to be applied.

4,526,285

COLLAPSIBLE BASKET

Leonard W. Cerveny, Kent; Christopher Bonham, Seattle; J. C. Mull, Jr., Mount Lake Terrace, and Jon V. Shellman, Seattle, all of Wash., assignors to Pacific Wire Works, Inc., Seattle, Wash.

Filed Oct. 18, 1983, Ser. No. 543,094
Int. Cl.³ B65D *6/18, 6/08*
U.S. Cl. 220—7 **7 Claims**



1. A collapsible basket comprising:

a generally rectangular bottom wall;

a plurality of side walls mounted to said bottom wall, each of said side walls being upwardly and inwardly pivotable between a flattened position extending substantially co-planar to said bottom wall, and a raised position extending substantially normal thereto;

abutment means disposed between adjacent ones of said side walls for limiting the inward pivotal travel of said adjacent side walls when said side walls are in the raised position;

tab means extending upwardly from said side walls beyond the upper periphery thereof; and

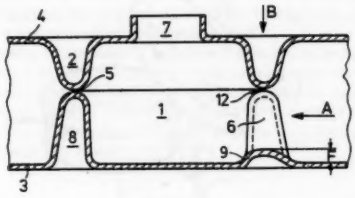
a wire-like peripheral clamp means disposable adjacent said side walls and pivotally mounted to one of said sidewalls to pivot between raised and lowered positions, with said lowered position encompassing and peripherally contacting said tab means to fix the position of said side walls between said clamp means and said abutment means.

4,526,286

THERMOPLASTIC FUEL TANK HAVING A SPLASH BAFFLE

Norbert Jüng, Lampertheim; Edmund Lindner, Ludwigshafen, and Volker Lohrbaecher, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 28, 1983, Ser. No. 461,745
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205592
Int. Cl.³ B60K *15/02;* **B65D** *25/04, 1/24, 6/28*
U.S. Cl. 220—22 **5 Claims**



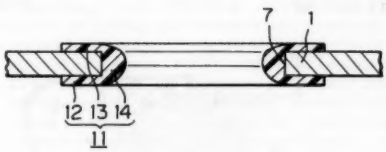
1. An improved fuel tank comprising: two mutually opposite tank walls each having inward ridge-like protrusions formed therein, said protrusions touching and being joined to one another at the points of contact to form a splash baffle within said tank between said walls, at least one opening formed in a lower positioned protrusion, and a threshold spacing said opening from the tank wall in which said lower positioned protrusion is formed, said threshold favoring retention of fuel within said splash baffle.

4,526,287

SHOCK-RESISTANT EASILY-OPENABLE VESSEL CLOSURE

Yasunori Miyamatsu, Ayase; Yasuo Kaga; Masanori Aizawa, both of Yokohama; Kazuhisa Ishibashi, Tokyo, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

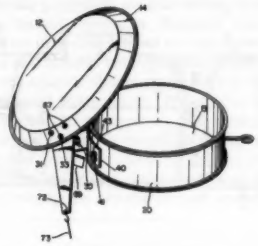
Filed Nov. 21, 1983, Ser. No. 554,100
Claims priority, application Japan, Nov. 19, 1982, 57-202041
Int. Cl.³ B65D *17/50, 41/02*
U.S. Cl. 220—260 **3 Claims**



1. An easily-openable vessel closure comprising a can end member having a preformed opening and an easily-tearable opening tab arranged on the outer side of the can end member to cover the opening and adhere closely to the peripheral portion of the can end member contiguous to the opening, wherein the opening of the can end member has such a size and shape that the opening is longer in the radial direction of the can end member, the opening extends from the inside of a circle concentric with the can end member, which has a diameter 0.35 times the seaming diameter of the can end member, to the point close to the outer periphery of the can end member and the portion defined by the contour of the opening and said circle involves a circle having a diameter of 5 mm, and wherein a thermoplastic resin coating having a -shaped section is formed on the cut edge of the opening of the can end member and the contiguous peripheral portion of the can end member

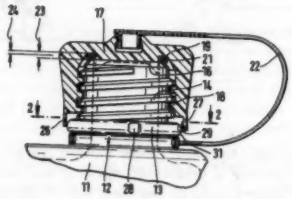
and the opening tab is bonded to the can end member through said resin coating.

4,526,288
REMOTE CONTROLLED COVER AND MOUNTING MEANS THEREFORE
Leo A. Schuld, P.O. Box 1685, Wausau, Wis. 54401
Filed Aug. 24, 1982, Ser. No. 410,967
Int. Cl.³ B65D *43/26*
U.S. Cl. 220—264 **2 Claims**



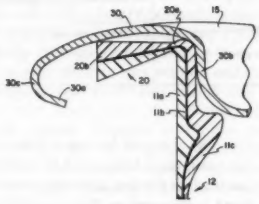
1. An offset angled pivot means of a cover for a bulk storage tank with remote controlles support therefor comprising additionally a cover member, a cord member with guidance means to remotely operate said cover, a spring latch means for returning said cover to a closed position, a spacing arrangement to permit said cover to be placed in a space vented position, wherein the pivot means is secured to a brace plate which is disposed to form an angular configuration; the movement of said plate by means of the pivot member facilitates removal and replacement of the cover by remote control in an efficient manner.

4,526,289
SCREW STOPPER FOR A CAN
Wolfram Schiemann, Eugen-Nagle-Strasse 17, 7140 Ludwigsburg, Fed. Rep. of Germany
Filed Jui. 24, 1984, Ser. No. 633,719
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328320
Int. Cl.³ B65D *53/00*
U.S. Cl. 220—304 **8 Claims**



1. Screw stopper for a fuel can of synthetic plastic material, comprising a pouring spout with external threads, a screw cap with internal threads screwable on the external threads of the pouring spout, and an elastically deformable seal arranged between the top of the screw cap and the edge of the pouring spout, wherein the cap top, after initial contact with the seal can be further pressed by an axial press stroke having a length exceeding which, the seal is irreversibly deformed or the engagement between internal and external threads is overloaded; further comprising the improvement wherein a snap device is provided between the screw cap and the pouring spout, in a manner such that on closure of the screw cap an acoustic signal is generated as soon as a predetermined spacing, within the range of the length of the press stroke, is reached between the cap top and the spout edge.

4,526,290
FLANGED CONTAINER
Daryl D. Cerny, Greenville, Ohio, assignor to Ball Corporation, Muncie, Ind.
Filed Oct. 19, 1983, Ser. No. 543,668
Int. Cl.³ B65D *8/08, 25/14*
U.S. Cl. 220—415 **6 Claims**



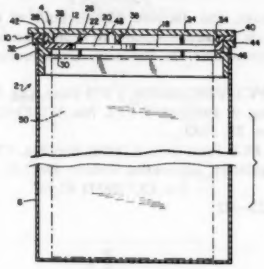
1. A closed, double-seamed container, comprising
an integral plastic portion forming a sidewall and a bottom wall and an end adapted to be closed and sealed, and
a metal closure for the end of the plastic portion,
said plastic portion and said metal closure each having outwardly extending flanges that have been formed to provide a double-seam seal,
the outwardly extending flange of said plastic portion having a narrow, perimetrical fold line adjacent and substantially parallel to the sidewall of the plastic portion and an originally thicker terminal portion, the thickness of said terminal position being greatest at its terminal edge wall, said fold line being thinner than the remainder of said flange and the portion of said flange adjacent said fold line thickening gradually toward said edge wall, said flange of the plastic portion being enclosed within the terminal portion of the metal flange of the container, said flange of the plastic portion being displaced by the terminal portion of the metal flange by compression of the originally thicker thermoplastic material, the terminal portion of the metal flange being bent around the displaced thicker thermoplastic material restricting said material therein and substantially completely filling said terminal portion of the metal flange to form a continuous seal thereby, the termination end of said metal flange being bent around the thicker thermoplastic material, the thermoplastic material being bent downwardly from the fold line of the plastic portion, said fold line being juxtaposed directly above the extending termination end of the metal flange to form a closed, double-seamed container.

4,526,291
DISPENSING PACKAGE FOR CONTAINING AND DISPENSING ARTICLES
Herman Margulies, South Orange, N.J., assignor to Sterling Drug Inc., New York, N.Y.
Filed May 16, 1983, Ser. No. 495,228
Int. Cl.³ A47K *10/24*
U.S. Cl. 221—63 **26 Claims**

1. A dispensing package for containing and dispensing articles, said package comprising:
a flexible bag adapted to contain articles to be dispensed, said bag having a closed first end and an open second end;
a collar fixed to said open second end of said bag, said collar including an upper outwardly extending peripheral flange and a lower inwardly extending peripheral flange;
a top including a top wall having therein a recess defined by a

bottom wall and a side wall joining said bottom wall to said top wall, said bottom wall having therein a dispensing opening and a slit connected with said dispensing opening, said top being selectively movable between a first position fitted to said collar and a second position removed from said collar, said top, when in said first position thereof, fitting into said collar with said top wall of said top abutting said upper flange of said collar and with said bottom wall of said top abutting said lower flange of said collar;

a lid selectively movable between a first position fitting into



said recess in said top and covering at least a portion of said top and a second position removed from said top; and

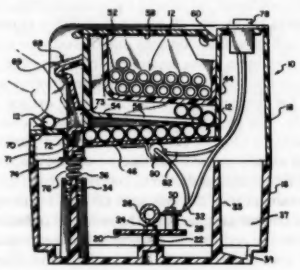
said lid including a first portion adapted to cover said dispensing opening when said lid is in said first position thereof, said lid including a first portion adapted to cover said slit when said lid is in said first position thereof, and said second portion of said lid being integrally but flexibly connected to said first portion of said lid, such that when said lid is in said first position thereof said second portion of said lid is selectively pivotable with respect to said first portion of said lid away from said top, thereby to uncover said slit.

4,526,292

CHEST FOR STORING, HEATING AND DISPENSING ARTICLES

Jay Waxman, Skokie, Ill., assignor to JayVol Inc., Ill.

Filed Jul. 25, 1983, Ser. No. 516,994
Int. Cl.³ G07F *11/00*; A47F *1/00*
U.S. Cl. 221—97 **10 Claims**



1. A chest for storing, heating and dispensing ampules of medical products such as novocaine, said chest being a generally hollow enclosure and having therein at least

a pair of separated compartments, the bottom wall of said compartments sloping downwardly toward the front of said chest and forming an inclined ramp

a cover for each of said pair of compartments which can be opened to remove or to place ampules in said compartments;

an opening in said chest in communication with each of said respective compartments;

a dispensing apparatus associated with each of said compartments for dispensing individual ones of said ampules stored in the individual ones of said compartments, the respective ones of said dispensing apparatus being disposed within one of said openings in said chest and normally biased to a closed position, said dispensing apparatus being manually depressable to a position permitting an individual one of said ampules on said inclined ramp to be extracted from said inclined ramp and to be dispensed from said chest by releasing and permitting said dispensing apparatus to return to the normally closed position;

heating apparatus within said chest for heating said ampules to a pre-established temperature; and

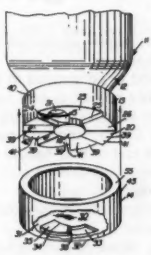
a plurality of openings in said chest for receiving and storing therein hypodermic syringes, said heating apparatus being disposed within said chest and juxtaposed to both said ampule storage compartments and said openings for the syringes, whereby both said ampules and hypodermic syringes are heated.

4,526,293

TAMPER RESISTANT CLOSURE MEMBER

Steven G. Kramer, 60 El Verano Way, San Francisco, Calif. 94127

Filed Jan. 31, 1983, Ser. No. 462,514
Int. Cl.³ B65D *83/04*
U.S. Cl. 221—298 **36 Claims**



18. A tamper resistant closure member adapted to be affixed to a dispensing container having an opening therein, which container is for holding solid dosage forms comprising:

an inner housing adapted to be fixedly mounted to an opening of the dispensing container, said inner housing having an interior surface and an exterior surface and including an inner housing opening therein through which the solid dosage form may pass, with said exterior surface having a recess in communication with said inner housing opening;

obstruction means movably positioned in cooperation with said opening of said inner housing to permit said obstruction means to move from a first closed position over said inner housing opening to a second open position;

an outer housing rotatably affixed to said inner housing, said outer housing having an interior surface towards said inner housing and an exterior surface away from said inner housing and including an outer housing opening therein positioned to cooperate with said inner housing opening said interior surface of said outer housing including projection means positioned to engage and substantially close said obstruction means as said outer housing opening is rotated in communication with said recess to permit a dosage form to exit through said outer housing opening; and

ratchet means affixed to said inner and outer housings thereby permitting said outer housing to rotate only in one direction relative to said inner housing.

4,526,294

DISPENSER FOR DISPENSING LIQUIDS IN CONTROLLED QUANTITIES FROM A BOTTLE

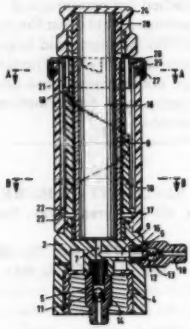
Adolf M. Hirschmann, Heilbronn; Klaus Käser, Weinsberg; Hans Rieker, Eberstadt; Hans-Peter Busch, Heilbronn; Willi Rathke, Erlenbach, and Heinz P. Maul, Eberstadt, all of Fed. Rep. of Germany, assignors to Glasgerätebau Hirschmann, Eberstadt, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,486

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1982, 3206307; Mar. 9, 1982, 3208436

Int. Cl.³ B67D 5/32

U.S. Cl. 222—47 8 Claims



1. A dispenser for dispensing liquids in controlled quantities, said dispenser comprising;

a cyiinder adapted to be secured to a valve block,

a piston adjustably guided in said cylinder for sucking and discharging an adjustable quantity of liquid,

a handle means for moving said piston, said piston being secured at one end to said handle means,

a cylindrical sleeve surrounding said cylinder and connected to said valve block at one end,

an annular clearance defined between said cylindrical sleeve and said cylinder,

an adjusting ring rotatably mounted on the other end of said cylindrical sleeve, said adjusting ring including two portions, a first portion located in said annular clearance and a second portion surrounding said cylindrical sleeve,

an adjustable stop secured to said first portion of said adjusting ring for changing the length of a stroke of the piston and said quantity of liquid to be sucked and dispensed, said quantity of liquid depending on the length of said stroke, said adjustable stop defining a stepped configuration and being rotatable about the peripheral circumference of said cylinder, said adjustable stop being axially fixed relative to said cylindrical sleeve,

a fixed stop located in said annular clearance and defining a detent shaped complementary to the stepped configuration of said adjustable stop, said fixed stop being secured at one end to said handle means and being slidably mounted in said cylindrical sleeve along the longitudinal axis of said cylindrical sleeve, the stepped configuration of said fixed stop spirally surrounding said cylinder in a single revolution,

an undulating surface defined by said cylindrical sleeve located around its periphery and located between said first portion and said second portion of said adjusting ring, and

detent means secured to said second portion of said adjusting ring and engaging said undulating surface of said cylindrical sleeve for fixing the position of said adjusting ring, said detent means being resiliently biased towards said undulating surface for locking said adjusting ring relative to said cylindrical sleeve,

said cylindrical sleeve, said adjusting ring and said adjustable stop being rigidly locked to each other by said detent means and upon withdrawal of said piston from said cylinder by said handle means, said fixed stop engages said adjustable stop and said piston is fixed relative to said cylinder at a position determined by adjustment of said adjusting ring, said adjusting ring regulating the length of said stroke of said piston and thereby regulating the quantity of liquid to be sucked and dispensed.

4,526,295

CARTRIDGE FOR INJECTING A SEMI-PASTY PRODUCT

André Morel, and Jacques Morel, both of Chateauneuf-En-Thymerais, France, assignors to Etablissements Morelateliers Electromecanique De Favieres, Chateauneuf-En-Thymerais, France

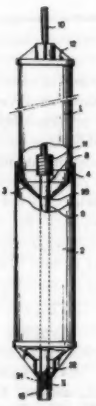
PCT No. PCT/FR82/00204, § 371 Date Aug. 9, 1983, § 102(e) Date Aug. 9, 1983, PCT Pub. No. WO83/02103, PCT Pub. Date Jun. 23, 1983

PCT Filed Dec. 8, 1982, Ser. No. 527,644

Claims priority, application France, Dec. 18, 1981, 81 23670

Int. Cl.³ B65D 83/00

U.S. Cl. 222—82 17 Claims



1. A cartridge for injecting into a hollow body (7) a semi-pasty product obtained by mixing two constituents, comprising two containers (1, 2), one of which is slidably mounted in the other and each of which contains one of said two constituents, one of the containers being separated from the other container by a partition wall (3), the other container having a discharge nozzle (5) for connection to the injection orifice (6) of the hollow body, this partition wall (3) and the discharge nozzle (5) each having a closure (17) pierceable by a perforating rod (8) mounted axially in the cartridge, to enable respectively the passage of the constituent from the first container into the second container and the passage of the resulting mixture through the discharge nozzle of the second container, characterised in that the rod (8) has a smooth leading portion (9) and a threaded rear portion (10), the leading and rear portions being separated by a short threaded intermediate portion (11) of larger diameter than the diameters of said leading and rear portions, that a first said container (1) has in its end (12) opposite to a second said container (2), a threaded opening (13) for receiving said threaded intermediate portion (11), that the free end (14) of the smooth portion (9) of the rod is threaded, that the discharge nozzle (5) of the second container has an internal thread (15) for receiving the thread (14) provided on the end of the smooth portion, that the length of the smooth portion is greater than the distance between the partition wall (3) and the thread (13) of the first container, and that the threaded rear

portion (10) of the rod (8) has a nut (18) for abutment against the outside of the cartridge, on the end (12) of the first container, to push this latter into the second container.

4,526,296

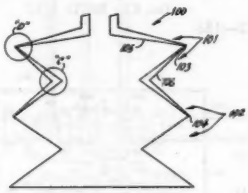
FLEXIBLE PLEATED CONTAINER STRUCTURE

Richard F. Berger, 11 Teaneck Rd., Ridgefield Park, N.J. 07660, and Greg Pardes, 425 E. 58th St., New York, N.Y. 10022

Continuation of Ser. No. 328,147, Dec. 7, 1981, abandoned, which is a continuation of Ser. No. 81,929, Oct. 4, 1979, abandoned. This application Jul. 1, 1983, Ser. No. 510,159

Int. Cl.³ B65D *37/00*

U.S. Cl. 222—107 **3 Claims**



1. A blow-molded, flexible dispensing container suitable for storing and dispensing products that are subject to oxidative-type deterioration comprising:

a. an at least partially pleated container wall structure of plastic material, said wall structure being flexible in one of its axial and radial directions and substantially rigid in the other one of said directions and having incorporated therein oxygen and water vapor barrier material in an amount sufficient to make the entire wall structure essentially impervious to oxygen and water vapor, said wall structure comprising a plurality of integrally connected superimposed layers, at least one of said layers having incorporated therein said oxygen and water vapor barrier material, said wall structure being slightly thinner at and near the extremities of the pleats than at the remaining portions of the pleats, the amount of oxygen and water vapor barrier material at said thinner portions being substantially the same than the amount incorporated in the remaining wall portions of the pleats; and

b. a dispensing spout structure connected to said wall structure and communicating with the interior of the container, said dispensing spout structure also being essentially impervious to oxygen and water vapor and being normally closed, said spout structure having pressure responsive discharge means which automatically open upon flexing of said wall structure to permit discharge of product therethrough, said discharge means automatically closing again when flexing of said wall structure is discontinued.

4,526,297

COLLAPSIBLE LAMINATED TUBE CONTAINER AND METHOD FOR MAKING IT

Arvid K. Grimsley, Stamford, Conn., assignor to Goodway Tools Corporation, Stamford, Conn.

Filed Jan. 25, 1983, Ser. No. 461,110

Int. Cl.³ B65D *35/08*

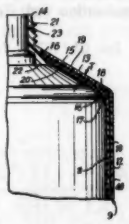
U.S. Cl. 222—107 **8 Claims**

1. A collapsible container comprising:

(a) a molded headpiece, said molded headpiece comprising a cylindrical neck and a bonding surface comprising a bottom surface of the molded headpiece;

(b) a laminated shoulderpiece, said laminated shoulderpiece comprising an inside surface and an outside surface, a portion of the outside surface of the laminated shoulderpiece being bonded to the bonding surface of the molded headpiece and the inside surface of the laminated shoulderpiece being positioned out of abutment with the molded headpiece;

(c) a laminated tube, said laminated tube having an inside surface and an outside surface, the upper portion of the outside surface of the laminated tube being bonded to a



portion of the inside surface of the laminated shoulderpiece, said molded headpiece, laminated shoulderpiece and laminated tube being arranged and constructed so that the molded headpiece, including all its integrally molded parts, is spaced from the laminated tube by a distance at least about three times the thickness of the laminated shoulderpiece.

4,526,298

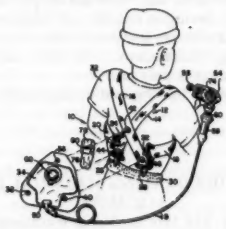
SPORT HYDRATION SYSTEM

Michael A. Boxer, Great Neck, N.Y., and Ben A. Posdal, Bridgewater, N.J., assignors to CardioSearch, Inc., Somerville, N.J.

Filed Feb. 28, 1983, Ser. No. 470,049

Int. Cl.³ B67D *5/64*

U.S. Cl. 222—130 **5 Claims**



1. A hydration system comprising:

a flexible liquid container having a fill opening for filling said container with liquid and having an outlet opening,

a liquid dispensing device,

a flexible tube having one end connected to the outlet opening of said container and the other end connected to said dispensing device, and

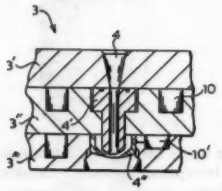
a suspension system for supporting the entire weight of said liquid container and the contents thereof on a centered position at the anatomic pivot point in the small of the back of an intended user of the hydration system with the outlet opening at a lower position than the fill opening,

wherein said suspension system comprises elastic shoulder straps having two rear strap portions and two front strap portions, said rear strap portions being crossed at a region in the middle of the back of an intended user with the ends thereof being adapted to be clipped to the shorts of the intended user, said rear strap portions being provided with a support button disc at the region of the cross over of said rear strap portions and with a similar support button disc adjacent the respective ends of said rear strap portions, said liquid container having spaced mounting holes for engagement with said support discs and thereby support by said suspension system.

4,526,299
APPARATUS FOR POURING CONFECTIONARY SOLUTION

Hermann-Otto Vongeheur, Neuwied, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,453
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138148
Int. Cl.³ A23G 3/12
U.S. Cl. 222—146.4 4 Claims

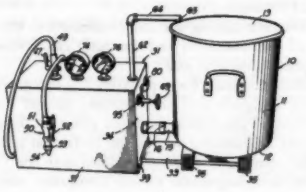


1. An apparatus for pouring a confectionery solution comprising:
(a) a confectionery solution supply tank;
(b) dosing means coupled to said supply tank;
(c) a nozzle plate coupled to said dosing means, said nozzle plate comprising, disposed one below another, a main plate, an insert holder plate and a base plate having frustrum-shaped inserts, said insert holder plate having nozzle inserts which project beyond the bottom edge of said insert holder plate and so extend into said frustrum-shaped inserts disposed in said base plate so that part of the nozzle inserts which project beyond the bottom edge of the insert holder plate cooperate with said frustrum-shaped inserts to form annular nozzles having an annular gap which narrow toward the exit end and wherein said nozzle plate also includes ducts for establishing communication between said annular gap and a heat medium supply; and
(d) heating means for heating said dosing means and said nozzle plate.

4,526,300
CONFECTION DECORATING MATERIAL DISPENSING MACHINE

George D. Woody, 919 18th St. N.W., Washington, D.C. 20006

Continuation of Ser. No. 823,613, Jul. 11, 1977, abandoned. This application Dec. 10, 1979, Ser. No. 102,247
Int. Cl.³ B67D 5/62
U.S. Cl. 222—146.5 10 Claims

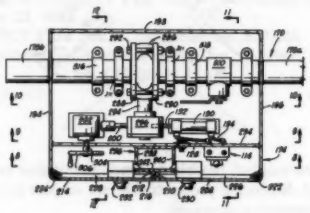


1. A decorating material dispensing machine comprising, a housing, a pump within said housing, an upwardly open reservoir tank outwardly of and adjacent to said housing for providing a source of fluid decorating material, connector means removably connecting said reservoir tank to the intake side of said pump, a flexible hose externally of said housing, means on said housing connecting the proximal end of said flexible hose to the discharge of said pump, a decorator nozzle member on the distal end of said flexible hose, a back pressure control valve within said housing communicating with the discharge side of said pump and a return line carried by said housing and extending over the open upper end of said tank and connected to said back pressure control valve for returning excess material to said source and over the top of said reservoir tank, said reservoir being removable from a position outwardly adjacent to said housing when said connector means is disconnected between said pump and said reservoir tank.

4,526,301
SECURITY SYSTEM FOR STORAGE TANKS

Clifford P. King, and Trudy L. Pierce, both of 4022-A Coronado, Oklahoma City, Okla. 73122

Filed Sep. 30, 1982, Ser. No. 430,359
Int. Cl.³ B67D 5/32
U.S. Cl. 222—153 20 Claims



20. A fluid storage tank security system comprising:
housing means;
a fluid discharge pipe extending through the housing means and adapted to discharge fluid from inside the tank;
valve means inside the housing means and positioned inside the discharge pipe to control the flow of fluid through he discharge pipe;
a selectively locked access way at one side of said housing means providing access, when opened, to a chamber within said housing means; and
control means accessible only via said access way for selectively preventing manual opening of said valve means by unauthorized personnel, wherein said control means includes a fluid actuated locking system for selectively locking and unlocking said valve means to facilitate subsequent opening or closing of said discharge pipe by use of said valve means.

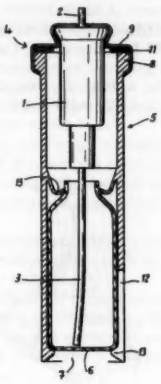
4,526,302
ADAPTER DEVICE FOR SPRAYING THE CONTENT OF A SECTILE AMPULE

Michel Brunet, Sainte Colombe la Commanderie, France, assignor to Sandoz Ltd., Basel, Switzerland

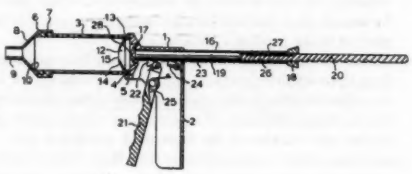
Continuation of Ser. No. 368,472, Apr. 14, 1982, abandoned. This application Jun. 1, 1984, Ser. No. 616,272
Claims priority, application France, Apr. 30, 1981, 81 08673
Int. Cl.³ G01F 11/06
U.S. Cl. 222—321 4 Claims

1. An adapter device for spraying the content of a sectile ampule comprising an element of generally tubular shape, sealingly and fixedly fitted at one end with a hand actuated spraying pump, the pump having an outer hollow actuation valve stem and a suction tube extending inside the tubular element substantially along its whole length, the other end of the tubular element being open for forming a tubular housing designed for receiving the sectile ampule, the tubular element including integral one piece molded therewith an annular lip extending from the tubular element's inner wall for providing a sealed connection with an ampule aperture, and a bead formed on the inner wall of the tubular element adjacent to its

open end for maintaining the ampule in its housing and cooperating with the lip to properly position the ampule in the tubular member; the periphery of the open end of the tubular member being capable to be extended resiliently.

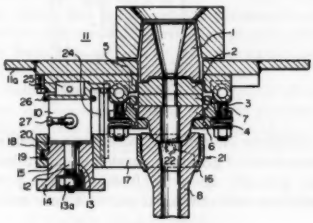


4,526,303
SYRINGES
Christopher G. C. Harrod, Surrey, England, assignor to Dentsply Research & Development Corp., Milford, Del.
Filed Oct. 26, 1983, Ser. No. 545,813
Claims priority, application United Kingdom, Nov. 5, 1982, 8231600
Int. Cl.³ B67D *5/46*
U.S. Cl. 222—386.5 **3 Claims**



1. A syringe comprising a body member detachably secured onto one end of a syringe barrel provided at its other end with a conical end cap terminating in a delivery tube and said barrel containing a piston member movable longitudinally therein, said piston member having a yieldable pressure face substantially complementary to the interior of said cap; a piston actuating assembly movably mounted in the body member and comprising an actuating tube generally coaxial with the barrel and a rod movably mounted within the actuating tube, said actuating tube having a longitudinal opening and said rod in said actuating tube having rack means thereon engageable by a pawl on a pivoted lever movable through said longitudinal opening to engage said rack means on said rod and thereby move a secondary plunger head after the piston member has moved to the distal end of said barrel, said pawl actuates said piston member and secondary plunger head in sequence to effect substantially complete discharge of the contents of the syringe barrel and a handle extending laterally from said body member and having a pivot supporting said pivoted lever whereby the said piston member is first displaced toward the distal end of the barrel to discharge a major portion of the contents of the barrel through said end cap and the said rod has said secondary plunger head thereon movable through the yieldable pressure face of said piston member and into the delivery tube of said end cap.

4,526,304
APPARATUS FOR RAPID CHANGING OF NOZZLES
Takahiro Nishimura, Fukushima, Japan, assignor to Allied Corporation, Morris Township, Morris County, N.J.
Filed May 16, 1983, Ser. No. 495,282
Int. Cl.³ B22D *35/00, 37/00*
U.S. Cl. 222—607 **1 Claim**



1. An apparatus for rapidly changing a submerged nozzle, comprising:

a rotary sleeve mounted adjacent to a teeming nozzle provided on a bottom portion of a ladle or tundish;

a submerged nozzle hanger having a base portion at one end thereof pivotally supported on said rotary sleeve and a submerged nozzle seating member provided at the free distal end thereof;

a submerged nozzle hanger raising and lowering mechanism which, when said submerged nozzle hanger is rotated about the axis of said rotary sleeve, is operable in response to rotation in a first direction for raising said submerged nozzle hanger from a first position at which the submerged nozzle is exchanged to a second position at which the submerged nozzle is mated with the teeming nozzle, and is operable in response to rotation in a second direction for lowering said submerged nozzle hanger from said second position to said first position; and

a positioning mechanism adjacent to the teeming nozzle for positioning said submerged nozzle hanger which positioning mechanism comprises first and second stopper rods implanted in a stationary frame adjacent to the teeming nozzle, said first stopper rod being of smaller length than said second stopper rod, and wherein said submerged nozzle hanger includes a bore in the side thereof facing said stopper rods, said submerged nozzle hanger coming into abutting contact with said second stopper rod in being raised by rotation in said first direction, whereby rotation of said hanger is stopped, said submerged nozzle hanger being subsequently raised along said second stopper rod to mate said bore with said first stopper rod, thereby positioning said submerged nozzle hanger.

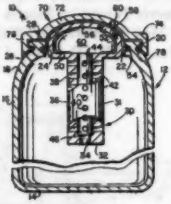
4,526,305
APPARATUS FOR MANUALLY DISTRIBUTING POWDER GRANULES
Norman R. Lykes, P.O. Box 15505, Phoenix, Ariz. 85060
Continuation-in-part of Ser. No. 223,249, Jan. 8, 1981, abandoned. This application Mar. 1, 1983, Ser. No. 470,971
Int. Cl.³ B65D *83/06*
U.S. Cl. 222—632 **5 Claims**

4. Plug apparatus for a powdered granule dispenser, comprising, in combination:

a cylindrical mixing chamber adapted to be disposed within the dispenser in which air and powdered granules are mixed;

a cylinder secured to and disposed below the mixing chamber and having an internal diameter substantially less than

the internal diameter of the mixing chamber; said cylinder being supported below the mixing chamber with the outer diameter of the cylinder being substantially less than the outer diameter of the mixing chamber; and



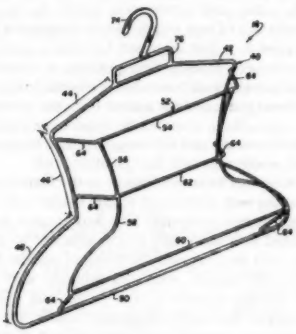
slot means on the cylinder, including a plurality of V-shaped slots oriented generally parallel to each other and extending generally upwardly from a bottom portion through which air and powdered granules flow into the cylinder.

4,526,306

GARMENT-SHAPING HANGER

Jack M. Zuckerman, Forest Hills, and John Warmath, Brooklyn, both of N.Y., assignors to Cut Rate Plastic Hangers, Inc., Forest Hills, N.Y.

Filed Feb. 22, 1979, Ser. No. 14,053
Int. Cl.³ A47J *51/096*
U.S. Cl. 223—88 **7 Claims**



1. A garment-shaping plastic hanger comprising a first body section adapted to have an operative position in shaping contact against the rear of a garment being diplayed on said hanger, a second body section adapted to have an operative position in shaping contact against the front of said garment, and interconnecting plastic struts operatively effective both to position said two body sections in a separated spaced relation generally parallel to each other and to join said sections into a unitary structure, said first and second body sections being respectively rearwardly and forwardly disposed in said unitary structure, whereby each body section is advantageously located adjacent the respective rear and front of the garment to be shaped thereby,

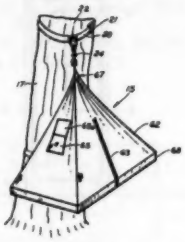
said front body section is defined by a peripherally shaped member having an open internal volume, and said second body section is defined by a corresponding smaller-sized peripherally shaped member having plastic struts connected transversely thereof, whereby said plastic struts minimize inadvertent distortion of the shape of the larger as well as of the smaller of said members while permitting stacking of similarly constructed hangers by the interfitting of each said smaller-sized member in said larger member.

4,526,307

PORTABLE COMBINATION TENT AND BACKPACK

Ronald J. Parker, 758 E. Railroad St., Columbia Falls, Mont. 59912

Filed Jul. 6, 1984, Ser. No. 628,422
Int. Cl.³ A45F *4/04*
U.S. Cl. 224—154 **11 Claims**



1. A combination suspension tent and backpack, comprising:

a plurality of framework pieces adapted for connection together;

frame connection means for connecting the framework pieces together to form a tent floor framework;

a tubular floor-pack envelope having a top layer and a bottom layer which are connected together along at least portions of an outside edge and inside edge to define an interior therebetween; the floor-pack envelope further having at least one open end through which framework pieces can be inserted and assembled within the floor pack envelope to form a tent floor therewith; said floor-pack envelope further forming an enclosure in which gear can be stored when the combination suspension tent and backpack is being used as a backpack;

shoulder harness means attachable to said floor-pack envelope upon exterior surfaces thereof for enabling the combination suspension tent and backpack to be carried upon the back and shoulders of a person and used to carry gear; within said interior of the floor pack envelope; and

suspension means connectible to the floor framework for suspending the floor framework, attached floor-pack envelope and any supported load from a supporting structure.

4,526,308

CAMERA SUPPORT

Dennis J. Dovey, 10522 Huntington Wood, Houston, Tex. 77099

Filed Jan. 9, 1984, Ser. No. 569,300
Int. Cl.³ G03B *17/00*; A45F *5/00*
U.S. Cl. 224—265 **5 Claims**

1. A camera support or the like comprising:

a first generally U-shaped tubular member having a base and first and second opposed, spaced apart legs extending therefrom;

said base having an elongated axis;

camera mounting means rotatably secured to the base of the first U-shaped tubular member generally intermediate the legs thereof;

said camera mounting means including a bracket having first and second elongated parts;

said first elongated part being rotatable through 360° about the elongated axis of the base;

said second bracket part being rotatable about the elongated axis of said first bracket part through 360°;

the elongated axis of said first bracket part being perpendicular to the elongated axis of said base;

and

first and second tubular extension means, one end of each of the tubular extension means secured to one of the legs of the first tubular member;

the free end of each of the tubular extension means together with the mounting means defining three points in a plane for the camera support so that the camera support will be self-standing on said three points for close-up photography or the like.

4,526,309

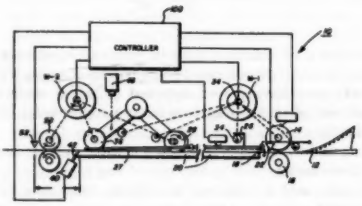
COMPATIBLE COPYING OF COMPUTER FORM DOCUMENTS

Thomas N. Taylor, Rochester, N.Y.; John R. Ellis, Concord, Mass., and Lawrence C. Hubler, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 13, 1982, Ser. No. 417,257

Int. Cl.³ B65H *9/06, 23/18, 25/32;* **G03G** *15/00*

U.S. Cl. 226—33 **8 Claims**



1. In a document handling apparatus for a copier having a platen for supporting and copying a document at the imaging station of the copier, the improvement in a dual mode document handling apparatus for automatically copying on said platen documents comprising either increments of computer form web original documents or individual original document sheets, comprising:

common input means for receiving either of said documents,

common frictional feeding means for moving either of said documents onto and over said platen,

registration means for automatically positioning either of said documents for copying on said platen,

sensing means for sensing when a computer form web document has been fed into said document handling apparatus through said common input means, and

dual mode control means responsive to said sensing means for differently controlling said common feeding means and said registration means automatically, depending on whether a computer form web or individual sheet document has been fed into said document handling apparatus through said common input means;

wherein the said common input means, said common feeding means and said registration means are operated by said dual mode control means in the same manner for the initial portion of computer forms web as for an individual document sheet but in a different manner for all subsequent portions of a computer forms web;

wherein said imaging station has a platen edge registration position, and werein said computer forms web increments and individual document sheets are both registered by said apparatus to said common platen edge registration position;

further including platen overlying document clamping means, and wherein said common frictional document feeding means includes a frictional feeding roller and an independently movable minor flap portion of said clamping means for resisting buckling of documents fed by said frictional roller, said roller extending through said flap portion over said platen, and said flap portion extending pivotably from adjacent said single roller to closely adjacent said platen registration edge position,

further including automatic lifting and optical shuttering means for said frictional feeding roller to prevent exposure thereof during copying of a document sheet.

4,526,310

PROCEDURE AND DEVICE FOR THE APPLICATION OF A LABEL TO AN ARTICLE

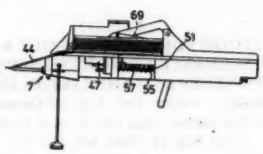
Bengt Lundén, Björkhagsvägen 27, S-186 Vallentuna, and Tord Pettersson, Skolvägen 2, S-182 Enebyberg, both of Sweden

Filed Apr. 1, 1983, Ser. No. 481,283

Claims priority, application Sweden, Apr. 1, 1982, 8202105

Int. Cl.³ A43D *69/00;* **B23P** *19/02, 19/04*

U.S. Cl. 227—67 **8 Claims**



1. A method for the application of a label having a first and a second pre-punched hole therein, to an article by means of an elastic fastening element fitted with a head comprising the steps of:

inserting a tube-shaped, longitudinally slit needle through said first pre-punched hole of said label;

pressing said needle through the article so that the tip of the needle penetrates through the opposite side of the article;

inserting said fastening element into said tube shaped, longitudinally slit needle such that said fastening element passes through said label and the article and such that said fastening element head is oriented at the tip of said needle;

withdrawing said needle from the article whereby the head of said fastening element is retained on the opposite side of the article and whereby said fastening element and said label are retained in the article; said step of inserting said needle through said first hole of said label including;

providing a magazine for holding a plurality of the labels therein;

feeding at least one of the labels from said magazine towards the needle wherein at least one of the labels from the magazine is effected by means of a lug protruding into the magazine, which lug presses the label in its longitudinal direction towards a guide means which deflects the label towards the needle until the needle is in contact with the first pre-punched hole in the label; and

feeding the label away from the needle by engaging said second hole with a hook means which partially draws the label back into the magazine whereinafter said hook means is disengaged from said second hole.

8. A tool for the application of a label having a first and a second pre-punched hole therein to an article with a fastening

element having a flexible head thereon to an article, said apparatus comprising:

a frame member with a nose section;

a tube-shaped, longitudinally slit needle removably mounted in and projecting from said nose section;

storage means integral with said frame member for removably retaining therein a plurality of said fastening elements;

feeder means operably associated with said storage means for passing the head of the fastening element through the needle;

a magazine attached to said frame for retaining therein a plurality of said labels;

a reciprocating label feed mechanism operably associated with said magazine for feeding at least one said label from said magazine towards said needle, said label feed mechanism also being operably associated with said fastening element feeder means whereby said label is positioned so that the first pre-punched hole therein is seated over said needle which then penetrates through the article to the opposite side thereof, and whereby said fastening element is inserted through said needle such that the head thereof extends from the tip of said needle, and wherein the flexible head of said fastening element retains said element in the article and fastens said label to the article;

said feeder means including a groove in the frame member; and

a return hook pivotably associated with said feed mechanism and movable along said groove in the frame such that said return hook engages said second pre-punched hole in the label.

4,526,311

METHOD FOR CARRYING OUT REPAIR, MAINTENANCE OR TESTING APPARATUS, COMPONENTS AND THE LIKE IN HOT CELLS

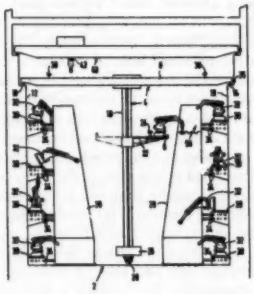
Günter Schröder, Wetter, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft etc., Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,716

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138484

Int. Cl.³ B23K *31/00*; B22D *19/10*; B23P *17/00, 19/00*

U.S. Cl. 228—119 **1 Claim**



1. A method of carrying out repair, maintenance or testing of conduit in a hot cell using a handling machine, machine tool, general tool, replacement part, working material or testing device, provided for such a purpose in the hot cell, comprising the following steps in combination:

a. substantially continuously remotely monitoring the conduit for damage or a defect using remotely operable television cameras and/or leak detectors to detect the damage or defect,

b. ascertaining the coordinates of the damage or defect by means of a computer,

c. selecting an appropriate handling machine, machine tool, general tool, replacement part, working material or testing device;

d. moving the selected handling machine, machine tool, general tool, replacement part, working material or testing device into a servicing position determined by the ascertained coordinates; and

e. remotely operating and monitoring by means of the computer the selected handling machine, machine tool, general tool, replacement part, working material or testing device wherein said operating step comprises the following sub-steps:

i. detaching the defective conduit part;

ii. aligning the remaining two free conduit ends with one another;

iii. aligning a replacement conduit part with the two free ends; and

iv. welding the replacement conduit part to the free ends.

4,526,312

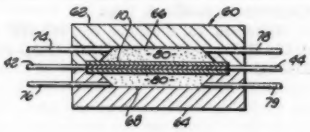
LOW COST METHOD OF MAKING SUPERPLASTICALLY FORMED AND DIFFUSION BONDED STRUCTURES

Joseph R. Goss, Huntington Beach, and David W. Schulz, Hermosa Beach, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 10, 1979, Ser. No. 102,091

Int. Cl.³ B23K *31/02*

U.S. Cl. 228—157 **15 Claims**



1. A method of making a metallic structure comprising:

providing a plurality of metal blank workpieces, each of said workpieces having two opposed principal surfaces, at least one of said workpieces having superplastic characteristics;

treating said workpieces at selected areas to prevent bonding at those areas;

positioning said workpieces in a stack, contacting at their principal surfaces, at least one of the outer workpieces of said stack having superplastic characteristics;

diffusion bonding said stack together in the untreated areas;

coupling at least one insert to said stack, such that said at least one insert and said bonded stack conform to the external configuration of said structure;

casting a mold about said at least one insert and said stack;

removing said at least one insert from said cast mold; and

expanding by superplastic forming at least one of said workpieces having superplastic characteristics against said cast mold to form said structure.

4,526,313

SOLDER WAVE APPARATUS AND METHOD

Paul Hug, Saratoga, and Antonio Tavares, San Jose, both of Calif., assignors to Storage Technology Partners, Louisville, Colo.

Filed Mar. 22, 1983, Ser. No. 477,798

Int. Cl.³ B23K *1/08*

U.S. Cl. 228—180.1 **7 Claims**

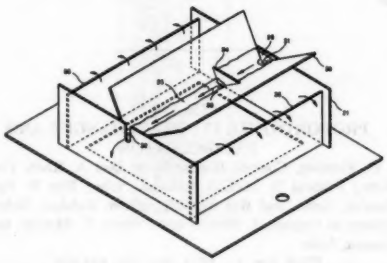
1. A method of tinning an article, such as the leads of an integrated circuit package, with molten solder with a minimum occurrence of solder splash, said method comprising the steps of:

(a) circulating molten solder between an outer and inner container by pumping the molten solder from the outer

container to a location more or less centered at the bottom of the inner container, whereby the molten solder may fall back into the outer container as a wave over the top of the lowest wall or walls of the inner container once the inner container is full;

(b) including in the circulation path of said molten solder a trough divided into the first and second sections, said molten solder entering said first section first and then being passed on to said second section, comprising the steps of:

(1) placing said trough across the top of said inner container, the bottom of said trough being positioned so as to be lower than the top of the lowest wall of said inner container;



(2) inserting a hole in the bottom of a first end of said trough;

(3) placing a dam at a selected location along the length of said trough, said dam comprising the separation between said first and second sections of said trough, and said dam including means for allowing said molten solder to pass from said first section into said second section; and

(4) inserting an opening in the side wall of said inner box above a second end of said trough, whereby the molten solder flowing through said second section may pass through said opening and fall back into said outer container; and

(c) dipping said article into said molten solder as said solder flows through the second section of said trough.

4,526,314

PACKAGE FOR FLOWABLE MATERIALS WITH FOLDLINES REINFORCED BY STRIPS

Wilhelm Reil, Bensheim, Fed. Rep. of Germany, assignor to Tetra Pak Developpement S.A., Pully, Switzerland

Filed Sep. 30, 1982, Ser. No. 431,921

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140336

Int. Cl.³ B65D *5/40*

U.S. Cl. 229—3.1 **1 Claim**

1. A packaging means for containing materials which are capable of flow, comprising:

a container formed from a generally rectangular packaging means blank, said blank being formed from a coated, foldable sheet material having a bottom edge, two opposing side edges, and a plurality of bending lines defined in said blank;

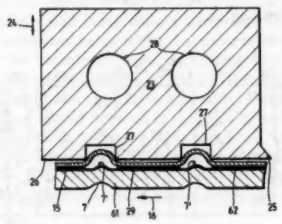
said bending lines being restricted to a region on said blank adjacent said bottom edge thereof, a first portion of said lines terminating at first points along said bottom edge of said blank and a second, remaining portion of said lines terminating at second points remote from said edge; and

a generally rectangular reinforcing strip formed of a plastic material and attached to said packaging blank along an attachment area defined thereon adjacent said bottom edge such that said strip extends over all of said bending lines and second points, but extends over only a relatively small portion of the entire area of said blank;

said strip being attached so that said attachment area terminates remotely from any of said bending lines;

said side edges of said blank being joined by a first sealing seam;

said bottom edge then being jointed by a second sealing seam to close said container; and



said bending lines being defined on said blank so that folding of said blank along said bending lines defines a region at the bottom of said container approximating a portion of a hollow block, said bending lines being restricted on said blank to the portion thereof forming said bottom block portion, and a region at the top of said container approximating a cylinder.

4,526,315

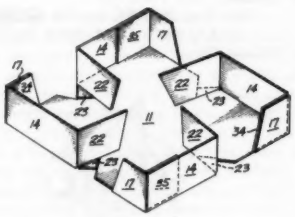
TRAY WITH PARTITIONS FORMED FROM SIDEWALLS

Herbert D. Muise, Orange, Calif., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Aug. 20, 1984, Ser. No. 642,329

Int. Cl.³ B65D *5/48*

U.S. Cl. 229—27 **4 Claims**



1. A blank for a partitioned tray comprising

a bottom panel;

side walls;

each of said side walls comprising

first and second side wall sections, each of said side wall sections being attached to said bottom panel by first score lines;

a partition panel between said first and second side wall sections, said partition panel being hingedly attached to said first side wall section by a second score line,

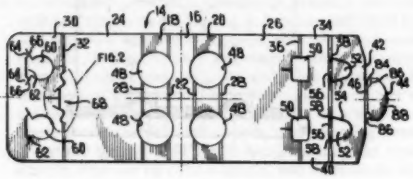
said partition panel being separated from said second side wall section by a first cut line and from said bottom panel by a second cut line;

a toggle panel formed in said bottom panel, said toggle panel being hingedly attached to said partition panel along a third score line extending between said second cut line and said second score line; and hingedly attached to said bottom panel along a fourth score line,

said second, third and fourth score lines meeting in a point, said toggle panel being separated from said bottom panel by

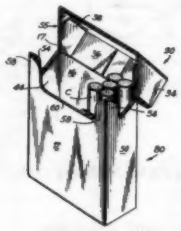
a third cut line extending between the outer ends of said third and fourth score lines.

4,526,316
LOCK ARRANGEMENT FOR CARTONS
Robert L. Sutherland, Campbell Hall, N.Y., assignor to Federal Paper Board Co., Inc., Montvale, N.J.
Filed Mar. 16, 1982, Ser. No. 358,879
Int. Cl.³ B65D *75/00*
U.S. Cl. 229—40 **11 Claims**



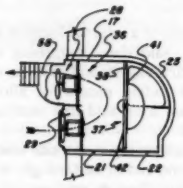
1. For use in a carton lock of the type including a male locking tab joined to the carton by a narrow neck having a locking shoulder on each side of said neck, an improved lock including a female slot arrangement formed in said carton and comprising a single linearly continuous first cut line having spaced generally aligned portions defining a pair of spaced locking ears and second cut lines intersecting said first cut line at adjacent sides of said ears and extending away from the general line of said first cut line wherein said ears are free to deflect.

4,526,317
FLIPTOP CARTON
Benjamin J. Cassidy, Waldwick, N.J., assignor to International Paper Company, New York, N.Y.
Filed Jun. 29, 1984, Ser. No. 625,883
Int. Cl.³ B65B *11/48*; **B65D** *85/10*
U.S. Cl. 229—44 CB **12 Claims**



1. A one-piece blank formed of stiff, resilient and foldable sheet material, such as paperboard, the blank being provided with a plurality of fold lines and cut lines to thereby define a plurality of walls and panels and adapted to form a container of rectangular parallelepiped shape having a hinged lid, the lid when closed forming a portion of the container, the blank being of generally rectangular form, the blank having mirror symmetry with respect to its longitudinal axis, the blank including, in series from its upper end to its lower end, a front lid wall, the latter hinged to a top lid wall, the latter hinged to a rear lid wall, the latter hinged to a rear wall, the latter hinged to a bottom wall, the latter hinged to a front wall, the five recited hinge connections being parallel to each other, the front lid wall carrying a lid side wall hinged to each lid wall side, the rear lid wall carrying a lid guide panel hinged to each side of the rear lid wall, the rear wall carrying a rear wall side panel hinged to each side thereof, the front wall carrying a front wall side panel hinged to each side thereof, the bottom edge of the front wall being centrally relieved to form a recess, the remaining, non-relieved bottom edge of the front wall defining first post-defining portions, the bottom edges of the front wall side panels being centrally relieved, the axially innermost portion of the bottm edge of the front wall side panels defining second post-defining portions, each lid guide panel being separated from its adjacent rear wall side panels by a cut line, each cut line forming an angle with respect to the axis of the hinge joining the rear lid wall to the rear wall, the widths of the lid side walls, the lid guide panels, rear side wall panels and the front wall side panels being substantially the same.

4,526,318
PROPORTIONAL FLUID EXCHANGER AND RECIRCULATOR
Ted D. Fleming, Council Bluffs, Iowa; Dan A. Koch, Omaha, Nebr.; Francis R. McGill, Omaha, Nebr.; Ray P. Powers, Omaha, Nebr., and Roy H. Michaelsen, Ralston, Nebr., assignors to Stephen T. McGill and Francis R. McGill, both of Omaha, Nebr.
Filed Jun. 11, 1984, Ser. No. 618,928
Int. Cl.³ F24F *7/00*
U.S. Cl. 236—49 **19 Claims**

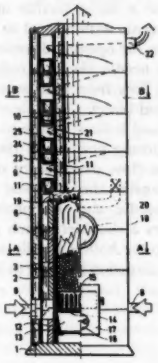


1. A fluid exchanger, comprising:
a first duct of rectangular section for introducing a fluid into a substantially enclosed space;
a second duct of rectangular section for withdrawing fluid from said space and having one edge of its exhaust opening in common with one edge of the intake opening of the first duct;
means for moving fluid through said first and second ducts;
chamber means of rectangular section, open on opposite ends, a first open end thereof contiguous with the intake and exhaust openings of said first and second ducts which have an edge in common;
damper means of a size and shape substantially equal to the section of the chamber means, pivotally mounted within said chamber means about an axis oriented parallel with the common edge of said first and second ducts and located a distance away therefrom substantially equal to the distance it is away from a wall of the chamber means which is contiguous with the wall of the first duct which is opposite its edge in common with the second duct; and
means for selectively pivoting said damper means from a position in which an edge of said damper means is adjacent the wall of the chamber means which is contiguous with the wall of the first duct which is opposite its edge in common with the second duct and which closes off the second open end of the chamber means to and in the direction of a position in which, said edge of said damper means is adjacent to the common edge of the exhaust and intake openings of the first and second ducts.

4,526,319
LOCAL HEATING INSTALLATION

László Tóth, IX. Bakáts tér 3, Budapest, Hungary

Filed Nov. 9, 1982, Ser. No. 440,291
Claims priority, application Hungary, Nov. 16, 1981, 3419
Int. Cl.³ F24D 5/00
U.S. Cl. 237—50 3 Claims

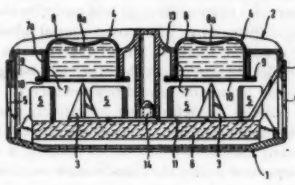


1. Heating installation for local use to be operated by aggregate fuel having both direct and indirect thermal emissions, a reactor within the combustion chamber, and a waste-heat flue and an outer heat accumulator case, said waste heat flue is defined by a uniform helical runway between said outer heat accumulator case and an inner heat accumulator case located above the reactor, air channels opening to a space to be heated being defined between a reactor case made of metal directly encircling the reactor and the outer heat accumulator case, said outer heat accumulator case being connected with at least one adherent part of the combustion chamber, wherein both the outer and inner heat accumulator cases are made with hollow walls and are fitted together from ring-shaped ceramic modular elements, said ceramic modular elements comprising "U" shaped distance rings fitted together in pairs and capable of being filled with sand and having interruptions for providing a continuous elevation of the waste heat flue, said waste heat flue transmitting heat to the outer heat accumulator case which in turn transmits heat by radiation to the space to be heated.

4,526,320
APPARATUS FOR VAPORIZING INSECTICIDES, PERFUMES AND/OR OTHER VOLATILE AGENTS

Fritz von Philipp, Neuburg, and Georg Schimanski, Hagen, both of Fed. Rep. of Germany, assignors to Globol-Werk GmbH, Nuremberg, Fed. Rep. of Germany

Filed May 3, 1983, Ser. No. 491,213
Claims priority, application Fed. Rep. of Germany, May 15, 1982, 3218480; May 15, 1982, 3218481; May 15, 1982, 8214314[U]
Int. Cl.³ A61L 9/04
U.S. Cl. 239—43 9 Claims

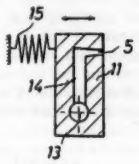


1. An evaporator device for insecticides, perfumes and/or other volatile substances, having a housing containing ports, and having an upper part and a lower part which housing has a receiving section in said upper part and in which a perforable container for the volatile substances is inserted, at least one opener means in said lower part contactable with said container for perforation of same, said lower part being rotatable with respect to said upper part to cause said opener means to pierce said container located in said receiving section to cause opening of the container and release of said volatile substances, the surface of the container facing the opener means being substantially planar and comprising a perforable film or foil, the rest of the container being stiffer and more resilient, means for absorbing the volatile substances emerging from the container upon perforation thereof, said ports communicating said released volatile substances with the atmosphere, and a further opening provided in said housing in the area of the receiving section through which at least a portion of the wall of the container inserted into the receiving section is exposed to the exterior, a wall of the container facing away from the receiving section comprising transparent of pigmented material.

4,526,321
APPARATUS FOR CLEANING SURFACES

Soren Knudsen, Soborg, Denmark, assignor to Gerni A/S, Randers, Denmark

Division of Ser. No. 262,869, May 12, 1981,. This application Sep. 12, 1983, Ser. No. 531,522
Int. Cl.³ B05B 3/14
U.S. Cl. 239—229 15 Claims



1. In an apparatus for cleaning surfaces by means of a jet of cleaning liquid and comprising a sluicing pipe opening into a nozzle tiltably arranged on said pipe and adapted to oscillate about an axis substantially perpendicular to the longitudinal axis of the nozzle, the improvement wherein said apparatus is portable, low weight and easily carried by an operator when in use, said nozzle is adapted to generate a reaction force in response to a jet of cleaning liquid flowing therefrom, and said apparatus comprising moving means at the discharge end of the sluicing pipe and arranged for being activated by the cleaning liquid flowing to the nozzle and connected to the nozzle in such manner that it drives said nozzle into oscillating movement as a result of being driven by the reaction force of the nozzle when cleaning fluid is flowing therefrom, said sluicing pipe comprising as part of said moving means a feeder connected to the nozzle and adapted to provide a pulsating flow of cleaning liquid, and with said nozzle arranged pivotally about an axis of rotation spaced from and perpendicular to the axis of the nozzle, and retained in position by spring means exerting a spring tension for permitting oscillating movements of said nozzle about said axis of rotation upon passage of a pulsating jet of liquid from said nozzle.

4,526,322
FLOW-REVERSING NOZZLE ASSEMBLY

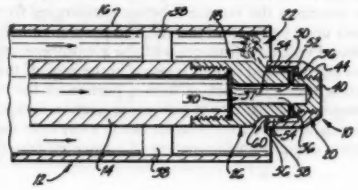
James T. Voorheis, Essex Fells, N.J., assignor to Voorheis Industries, Inc., Fairfield, N.J.

Filed Mar. 26, 1982, Ser. No. 362,224
Int. Cl.³ B05B 7/10
U.S. Cl. 239—404 25 Claims

1. A burner nozzle assembly for receiving and transporting liquid fuel for atomization prior to combustion, comprising:

A. a nozzle body having an outer surface, at least one inlet port, at least one axially extended central bore communicating with said inlet port for transporting said liquid fuel therein in a first direction, and at least one transverse passage fluidly connecting each said central bore and the outer surface of said nozzle body and defining an acute tangent angle to the point of its emergence on the outer surface of said nozzle body for imparting a unidirectional spin to said liquid fuel exiting at said point of emergence;

B. a nozzle cap mounted on said nozzle body, and located distally with respect to said inlet port; and



C. a flow reversing fluid passage defined by said nozzle cap and the outer surface of said nozzle body adjacent to said at least one transverse passage for reversing the direction of flow of said liquid from the direction of flow thereof within said bore, and said flow reversing fluid passage having an opening for the egress of said liquid fuel from said nozzle assembly such that the direction of travel of said liquid fuel emerging from said nozzle assembly is essentially opposite to that of a second, atomizing fluid, traveling adjacent said nozzle assembly, to provide a collision between said fuel and said atomizing fluid, resulting in improved atomization of said liquid fuel, at reduced emission velocities and fluid pressures.

4,526,323

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

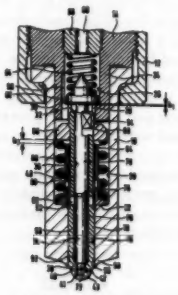
Kurt Seifert, Esslingen-Zollberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,376

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3120044; Aug. 1, 1981, 3130621

Int. Cl.³ B05B *1/32*

U.S. Cl. 239—453 **20 Claims**



1. A fuel injection nozzle for internal combustion engines, a nozzle body, said nozzle body including a guide bore at one end and a larger diametic bore, a nozzle holder including a protrusion end which extends into said larger diameter bore of said nozzle body, a hollow needle in said guide bore and extending into said larger diameter bore of said nozzle body, a fuel inlet for admitting fuel into said nozzle holder and said larger diameter bore of said nozzle body, said hollow needle displaceable by the pressure of the fuel in its flow direction, a closing spring which applies a counterforce on said hollow needle by use of a pressure ring, in which said hollow needle includes an internal valve seat to prevent fuel flow through an outlet in said hollow needle, a valve needle within said hollow needle cooperating with and displaceably supported relative to the valve seat to form a valve, further including means for retaining said valve needle with respect to said hollow needle which means moves in the opening direction in order to open said valve, said valve needle having a reduced diameter portion that permits fuel flow from said larger diameter bore of said nozzle body to said outlet, a stop shoulder on said nozzle body for supporting said hollow needle to absorb the closing spring force in the closing position of the valve, said valve needle is urged in the flow direction of the fuel by a valve spring and is pressed against the valve seat in the closing position of the hollow needle, and said protrusion end of said nozzle holder includes a shoulder which restrains the valve needle with respect to the hollow needle as said valve needle moves in the opening direction in order to limit the movement of said valve needle.

4,526,324

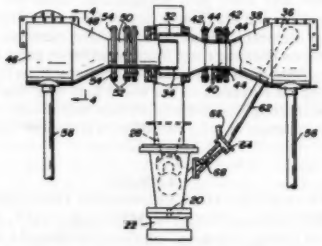
JET-TYPE GRINDING MILL

Nicholas N. Stephanoff, deceased, late of Haverford, Pa., and Raymond S. Page, III, executor, 1100 One Franklin Plaza, Philadelphia, Pa. 19102

Filed Mar. 5, 1984, Ser. No. 586,115

Int. Cl.³ B02C *19/06*

U.S. Cl. 241—5 **10 Claims**



1. A jet-type grinding mill for relatively large particles wherein said particles are entrained in a gaseous vortex and caused to pulverize each other during their passage through a grinding chamber in the mill, a classifier section upstream of the grinding chamber, and an outlet from the classifier section, lighter ground particles being separated from heavier ground particles in the classification section by centrifugal force, and the lighter particles passing through said outlet by the action of said centrifugal force, a pair of opposed coaxial tubular nozzles within said classifier section, one of said nozzles having a relatively smaller diameter than the other and being arranged within said other in radially spaced relation thereto, the nozzle of relatively smaller diameter being operatively connected to said outlet and said other nozzle being operatively connected to said grinding chamber, said nozzles forming a secondary centrifugal separator within the classification section, whereby the finer particles are drawn into the smaller nozzle while the heavier particles are maintained separate therefrom in the annular chamber formed between the two nozzles.

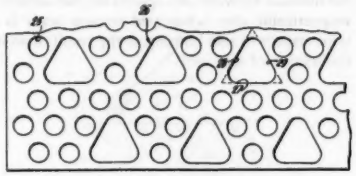
4,526,325
HAMMERMILL APPARATUS FOR SUBDIVIDING CELLULOSIC MATERIAL

Patrick W. Whiteman, Reston, Va., assignor to Recycled Paper Bedding, Inc., Reston, Va.

Division of Ser. No. 291,482, Aug. 10, 1981, Pat. No. 4,378,756, which is a continuation of Ser. No. 74,238, Sep. 10, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 429,630

Int. Cl.³ B02C *13/286*

U.S. Cl. 241—73 **5 Claims**



1. In an apparatus for subdividing cellulosic sheet material to give flat particles with irregularly shaped major surfaces of a maximum diameter not more than about three times the minimum diameter, said maximum diameter being less than about one-inch, said particles having a size distribution of at least about 15 wt. percent greater than one-quarter inch in maximum diameter, at least about 40 wt. percent greater than 1/32 inch but less than one-quarter inch in maximum diameter and not more than about 30 wt. percent smaller than 1/32 inch in maximum diameter, a series of two hammermill stages, each hammermill stage including a screen, the improvement which comprises said screens containing:

a. a majority of smaller holes of about one-half inch diameter, and

b. a minority of larger, triangularly shaped holes approximating a triangle with sides of 1.3 to 1.7 inches,

said triangularly shaped holes being oriented in said screens to receive a flow of said cellulosic material perpendicularly across one of said sides.

4,526,326
TRAVERSE ROLL FOR FILAMENT YARN CROSS WINDING APPARATUS

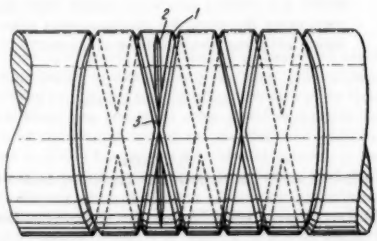
Allen A. Bloomfield, Aylesbury, England, and James R. Goodall, Charlotte, N.C., assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 395,370, Jul. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 248,643, Mar. 27, 1981, Pat. No. 4,384,689. This application Jan. 23, 1984, Ser. No. 572,619

Claims priority, application United Kingdom, Apr. 2, 1980, 8011073

Int. Cl.³ B65H *54/34, 54/48*

U.S. Cl. 242—43.2 **3 Claims**



1. A traverse roll for a filament yarn cross winding machine, said roll having reversed helical traverse groves in its surface, the reversed helical groves crossing each other, characterized in that the roll is provided with a circumferentially oriented groove lying in a plane perpendicular to the axis of the roll, such circumferentially oriented groove intersecting the helical traverse groove at at least one point and further characterized in that the helical groove is deeper than the circumferential groove.

4,526,327
FISHING SPINNING REEL

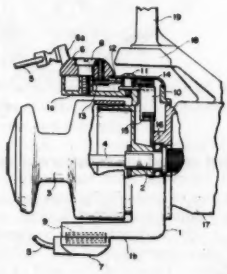
Kounin Sazaki, Fuchu, Japan, assignor to Ryobi Limited, Fuchu, Japan

Filed Jul. 25, 1983, Ser. No. 516,944

Claims priority, application Japan, Aug. 2, 1982, 57-119267[U]

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 G **3 Claims**



1. In a fishing spinning reel comprising a rotatable rotor, a bail arm rotatable between a line casting and a line-rewinding position, a bail arm lever coupled to said bail arm, a bail arm cam coupled to said bail arm, and a rotatable handle for rotating said bail arm;

the improvement comprising:

said bail arm having opposite ends respectively secured to said bail arm lever and said bail arm cam;

said rotor having opposing arms on which said bail arm lever and bail arm cam are respectively rotatably mounted;

first means for rotating said bail arm from said line-casting position thereof to an intermediate position thereof upon rotation of said handle; and

second means for successively rotating said bail arm from its intermediate position to said line-rewinding position thereof upon successive rotation of said handle;

said first means comprising a kick plate mounted on a supporting member and arranged to contact said bail arm lever when said rotor is rotated while said bail arm is at its line-casting position; and

said second means comprising a kick boss secured a reel body; and a kick lever pivotally mounted on one of said opposing arms of said rotor, one end of said kick lever being coupled to one of said bail arm cam and said bail arm lever and the other end of said kick lever being arranged to contact with said kick boss after said bail arm is rotated to its intermediate position.

4,526,328
EMERGENCY LOCKING REEL FOR BELTS

Ewen P. Kilpatrick, Eltham, Australia, assignor to Repco Limited, Melbourne, Australia

Filed Apr. 19, 1983, Ser. No. 486,435

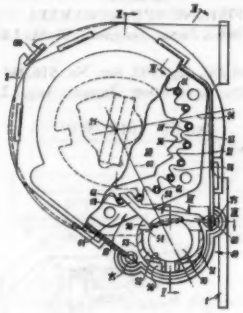
Claims priority, application Australia, May 4, 1982, 3848; Dec. 9, 1982, 7203

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **19 Claims**

1. An emergency locking reel for a safety belt including a

frame, a spindle rotatably mounted on said frame, a housing secured to said frame and being substantially symmetrical about a plane containing the axis of said spindle, locking means contained within said housing and being operable to prevent rotation of said spindle relative to said frame in one dircetion, a locking ring forming part of said locking means and being secured to said frame against relative movement, the opening through said ring being coaxial with said spindle, a plurality of



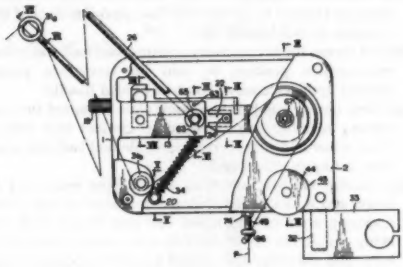
teeth provided around the periphery of said opening at regularly spaced intervals, each said tooth projecting inwardly towards the axis of said spindle and having a shape which is substantially symmetrical about a plane which contains the spindle axis, a vehicle deceleration responsive sensor which is operable to cause operation of said locking means, and said housing includes a receptacle for part of said sensor and said receptacle being located outwardly of said opening and substantially symmetrical about said housing symmetry plane.

4,526,329

MAGNETIC TENSIONING DEVICE

Shuji Takeda, Oume, Japan, assignor to Tanac Engineering Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,166
Claims priority, application Japan, Mar. 29, 1983, 58-53381
Int. Cl.³ B65H *59/16*
U.S. Cl. 242—155 M **7 Claims**



1. A magnetic device for controlling the tension applied to a wire comprising

a housing;

a main tension pulley rotatably secured to said housing;

a tension lever having one end displaceably attached to said housing;

a second tension pulley rotatably secured to the other end of said tension lever, said wire being fed through said main and second tension pulleys and having fluctuations in the tension thereof absorbed by displacement of said tension lever;

magnetic means for generating a braking torque on said main tension pulley, said magnetic means including a spaced magnet member and magnetizable disc;

adjusting means coupled to said magnetic means for setting the distance between said magnet member and said magnetizable disc, the distance between said magnet member and said disc set by said adjusting means determining the braking torque on said main tension pulley when said wire is under a normal running tension; and

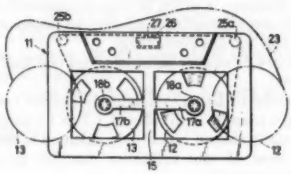
torque modifying means coupling said tension lever to said magnetic means, said torque modifying means increasing the distance between said spaced magnet member and said magnetizable disc when said tension lever is displaced with respect to said housing as the result of an increase in the tension of said wire.

4,526,330

TAPE CASSETTE HAVING REMOVABLE REELS

Tokuzo Shimizu, Tokyo, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed May 16, 1984, Ser. No. 610,629
Claims priority, application Japan, May 17, 1983, 58-72551[U]; May 20, 1983, 58-76469[U]; Oct. 13, 1983, 58-158474[U]; Dec. 16, 1983, 58-193750[U]
Int. Cl.³ G03B *1/04*
U.S. Cl. 242—199 **10 Claims**



1. A tape cassette comprising:

a cassette case comprising a pair of plate parts which parts define therebetween a front opening which is located on the front of said tape cassette for allowing a tape to enter within said cassette case, and a side opening which is located on at least one side of said cassette case;

a pair of reels for winding said tape thereon, said reels being inserted into and removed from said cassette case through said side opening without the need to open the plate parts; and

a pair of support parts provided displaceably on at least one of said plate parts, for rotatably supporting said reels which are inserted into said cassette case, said support parts being displaced for disengagement from said reels which are being removed from said cassette case.

4,526,331

CRANK AND BRAKING MECHANISM FOR FISHING REELS

M. Larry Tunks, 16042 Mariner Dr., Huntington Beach, Calif. 92649

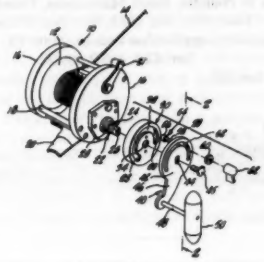
Filed Nov. 10, 1983, Ser. No. 550,757
Int. Cl.³ A01K *89/00, 89/02*
U.S. Cl. 242—218 **9 Claims**

5. A braking mechanism for retrofitting a fishing reel, the fishing reel comprising a spool, a brake for controlling the

amount of drag on fishing line being unwound from the spool, and a shaft for driving the spool and provided with a threaded end portion extending axially outwardly of the spool, the braking mechanism comprising:

(a) braking wheel for threading onto the end portion of the shaft to rotate therewith, the amount the braking wheel is threaded onto the shaft controlling the amount of drag, the braking wheel having a slot extending circumferentially around part of its periphery;

(b) a crank mountable on the end portion of the shaft



beyond the braking wheel for rotating the shaft and the braking wheel;

(c) a stop extending into the slot of the braking wheel for limiting the amount the braking wheel can be threaded onto the shaft;

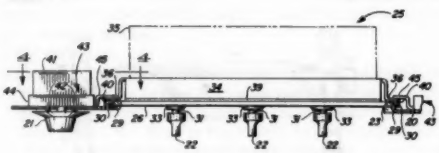
(d) means for adjustably mounting the stop on the crank comprising a circumferential slot extending through a disc-shaped portion of the crank, the crank slot being in register with at least a portion of the slot of the braking wheel, and wherein the stop is slideable in the crank disc slot.

4,526,332

CONTROL PANEL CLOCK LENS ARRANGEMENT

Michael E. Bales, New Palestine, Ind., assignor to The Maytag Company, Newton, Iowa

Filed Jun. 18, 1984, Ser. No. 621,851
Int. Cl.³ G12B *9/00*
U.S. Cl. 248—27.1 **11 Claims**



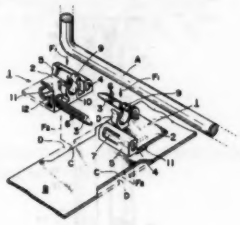
1. An appliance control panel having an improved clock-timer lens mounting arrangement, comprising: control panel means defining an opening for displaying the face of an appliance clock-timer; lens means for closing said opening in said control panel means; and means for securing said appliance clock-timer and said lens means behind said opening in said control panel means including means for clamping said clock-timer and said lens means to the rear of said opening with said lens means in a generally contiguous sealing association to said control panel means around said opening to provide a clock-timer lens mounting arrangement in which said panel means at the periphery of said opening is effectively sealed to said lens means without auxiliary decorative frames thereby preventing soil infiltration from the environment of the face of the control panel means onto the face of said clock-timer.

4,526,333

HOLDING DEVICE

Daiji Nakama, Chigasaki, and Shigeru Kimura, Kamakura, both of Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Jan. 5, 1983, Ser. No. 455,631
Claims priority, application Japan, Jan. 11, 1982, 57-1222[U]
Int. Cl.³ F16L *3/08*
U.S. Cl. 248—73 **14 Claims**



1. A holding device consisting of a pair of identical one-piece integral plastic counterparts, each comprising:

a base including front and side edges,

a holding means provided on the upper surface of said base for holding an elongated article substantially parallel to said base,

a rod is provided extending in parallel spaced relation to said upper surface of said base along one side edge, said rod having a substantial portion thereof extending outwardly beyond said front edge of said base, said extending portion including a plurality of ratchet notches,

a guide channel provided along the other side edge of said base and having an open end facing said front edge for complementary acceptance of said rod of a mating counterpart, each said guide channel having its inner surface provided with a catch projection of a shape complementary to the shape of the notches of said rod of the matching counterpart for sequential engagement of at least one of said notches,

and front edge, rod and guide channel of each counterpart being arranged so as to face said front edge and respective guide channel and rod of the mating counterpart, and

an engaging leg projected downwardly from the undersurface of said base,

whereby the engaging legs of the pair of counterparts firmly clamp opposite edges of a support member by adjusting the length of the rods inserted into the guide channels so as to conform said engaging legs to the spacing size of the said edges of said support member and the holding means of the pair of counterparts being adapted to grip the elongated article at spaced points thereon.

4,526,334

DEVICE FOR ADJUSTING THE HEIGHT OF DESKTOP, CHAIR OR SIMILAR

Pekka Rantakari, Jokela, Finland, assignor to Martela OY, Finland

Filed Sep. 28, 1982, Ser. No. 427,984
Claims priority, application Finland, Sep. 28, 1981, 813005
Int. Cl.³ F16M *11/00*
U.S. Cl. 248—157 **10 Claims**

1. Apparatus for adjusting the height of an article, such as a table, chair or the like, comprising:

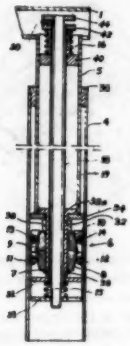
a base;

at least one substantially vertical guide tube mounted on said base;

slide means connected to an article whose height is to be adjusted, said slide means being movably mounted within said guide tube;

locking means connected to said slide means for locking said slide means at a selected position within said guide tube to thereby lock the article at a desired height, said locking

means including at least one first wedge member mounted on said slide means having a wedge surface which defines a first space with said guide tube which diminishes in size in the upward direction and at least one corresponding first locking member positioned in said first space, and at least one second wedge member mounted on said slide means having a wedge surface which defines a second space with said guide tube which diminishes in size in the downward direction and at least one corresponding second locking



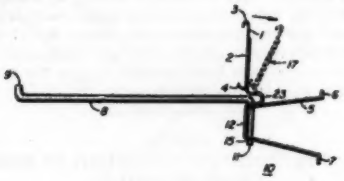
member positioned in said second space, said at least one first wedge and locking members constituting means for preventing downward movement of said slide means and said at least one second wedge and locking members constituting means for preventing upward movement of said slide means; releasing means for moving at least one of said first and second locking members in a substantially vertical direction for locking or releasing said slide means with respect to said guide tube.

4,526,335

MERCHANDISE HOLDER AND DISPLAY DEVICE

Benjamin L. Garfinkle, Alameda, Calif., assignor to Clamp Swing Pricing Co., Alameda, Calif.

Filed Oct. 3, 1983, Ser. No. 538,507
Int. Cl.³ G09F *3/18*
U.S. Cl. 248—221.4 **5 Claims**



1. A device for the supporting of merchandise and for displaying merchandise information comprising:

A. a label holder facing forward of the device;

B. merchandise support means facing on the same side of the device as the label holder comprising an elongated, substantially straight section for the support of merchandise to be displayed and a bent elbow section located proximate and below said label holder for fixedly connecting said merchandise support means to a channel means;

C. channel means facing on the opposite side of said label holder having lips for fitting within the channels of a tag molding and further having openings for accepting and supporting said merchandise support means; and

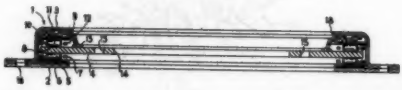
D. spring means for connecting the label holder with the channel means wherein when unflexed, said spring means positioning said label holder in an abutting relationship with said elbow of said merchandise support means to prevent its removal from the openings located in said channel means.

4,526,336

ORIENTABLE PIVOT IN PARTICULAR FOR A TELEVISION SET

Jean Durivault, and Bernard Branche, both of Vierzon, France, assignors to Nadella, Rueil Malmaison, France

Filed Nov. 10, 1983, Ser. No. 550,963
Claims priority, application France, Nov. 10, 1982, 82 18898
Int. Cl.³ A47B *95/00*
U.S. Cl. 248—349 **7 Claims**



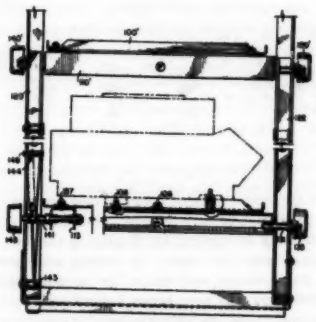
1. An orientable pivot in particular for a television set, comprising a case, a support plate parallel to and spaced from said case, mounting means comprising two series of rolling elements disposed on each side of said support plate adjacent to an outer peripheral edge of said support plate between said support plate and said case for rotatively mounting said support plate relative to said case, said case support plate and said series of rolling elements being coaxial, and combined resiliently yieldable means for taking up axial play between said case and said support plate and for braking said support plate relative to the case, said resiliently yieldable means being in an axially stressed condition between said case and said support plate and in rubbing contact with said support plate.

4,526,337

PROJECTOR STACKING STAND

Vladimir Viasmensky, Valley Stream, N.Y., assignor to General Audio-Visual Inc., Valley Stream, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,228
Int. Cl.³ F16M *1/00*
U.S. Cl. 248—639 **7 Claims**



1. A projector stacking stand for supporting at least one image projector, comprising:

a. a frame;

b. at least one mounting platform for supporting an image projector;

c. means connecting said mounting platform to the frame for

enabling adjustment of the pitch, roll and yaw thereof relative to the frame, the connecting means comprising;

i. a gimbal having three discrete pivot axes corresponding to the pitch, roll and yaw axes,

ii. means for moving the gimbal about the pitch and roll axes comprising at least one cable having at least one turn around cooperating shafts, means connecting the cable to the frame under tension and means for rotating each shaft to effect movement of each shaft along its cable, whereby pitch and roll adjustments are obtained by rotating the shafts and

iii. means for rotating the base about the yaw axis relative to the gimbal

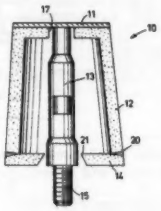
wherein the means for moving the gimbal about the pitch and roll axes comprises two shafts, means mounting each shaft on the gimbal for independent rotation with the axes thereof disposed parallel to the pitch axis, a cable for each shaft having at least one turn therearound, means connecting each cable to the frame under tension with a portion above and below the turn around the shaft and means for rotating each shaft to effect vertical movement of each shaft along its cable, whereby pitch adjustment is obtained by rotating the two shafts simultaneously in the same direction and roll adjustment is obtained by rotating the shafts individually.

4,526,338

HIGH PRESSURE MOLDING RISER

Dennis J. Reiland, Roseville, Minn., assignor to General Foundry Products Corporation, Blaine, Minn.

Filed Apr. 23, 1984, Ser. No. 602,904
Int. Cl.³ B22C 9/08
U.S. Cl. 249—197 **7 Claims**



1. A riser for inserting into a mold, said riser formed of a material breakable under the high pressure forces encountered in a molding machine;

a top surface on said riser;

a support member located on said top surface of said riser, said support member having an area operable to engage a support pin so that when a force is applied to said support member at least part of the force is transmitted to said support pin to thereby prevent breakage of the riser formed of the breakable material when the riser is subjected to the high pressure forces encountered in a molding machine.

4,526,339

BLOWOUT PREVENTER

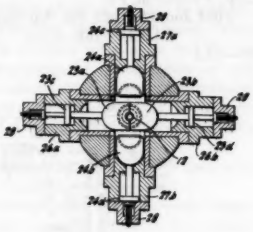
Charles J. Miller, Menlo Park, Calif., assignor to Universal Well Control Systems, San Francisco, Calif.

Filed May 11, 1984, Ser. No. 609,554
Int. Cl.³ F16K 3/02
U.S. Cl. 251—1.3 **4 Claims**

1. A blowout preventer comprising:

a substantially spherical body having a vertical bore for accommodating a drill string of an oil or gas well and first and second pairs of opposed bores radiating laterally in a common plane from said vertical bore;

first and second pairs of replaceable sleeve-like ram guideways inserted respectively into said first and second pairs of opposed bores;



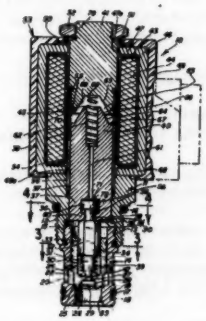
a pair of rams reciprocable in each pair of said guideways for selectively sealing said vertical bore.

4,526,340

SOLENOID VALVE

Abel E. Kolchinsky, Glenview, and Shaukat Kazi, Chicago, both of Ill., assignors to Imperial Clevite Inc., Glenview, Ill.

Filed Jun. 28, 1982, Ser. No. 392,514
Int. Cl.³ F16K 31/40, 31/42
U.S. Cl. 251—38 **12 Claims**



1. In a solenoid valve structure having a solenoid plunger having an axial bore, and a valve pilot for controlling the movement of a main valve poppet, the improvement comprising:

means in an end portion of the plunger defining a radially extending T-slot, the head portion of the T-slot opening to said plunger bore and the stem portion of the T-slot opening longitudinally through the end portion of the plunger;

means on said valve pilot defining a connecting head received in said slot, the head portion of said T-slot extending fully transversely through the plunger; and

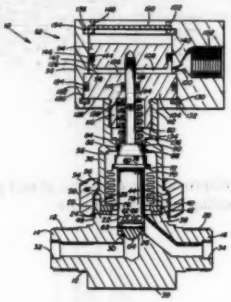
means for preventing said connecting head of the valve pilot from closing said plunger bore in said head portion of the T-slot, said means for preventing said connecting head from closing said plunger bore comprising means for maintaining said connecting head spaced from said plunger about the opening of said bore to said T-slot.

4,526,341

PNEUMATIC SHUT-OFF VALVE

John H. Thomas, Pittsburgh, Pa., assignor to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Filed Jun. 15, 1983, Ser. No. 504,628
Int. Cl.³ F16K *41/10*
U.S. Cl. 251—63.5 **11 Claims**



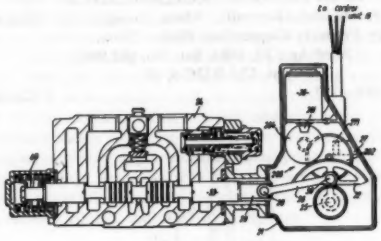
1. A valve comprising,
a valve body having a valve chamber therein,
said valve chamber including an upper portion with an opening therethrough and a lower portion having a valve seat,
inlet and outlet openings extending through said valve body and communicating with said valve seat,
a bonnet positioned in said chamber upper portion and connected to said valve body,
said bonnet having a passageway therethrough aligned with said chamber,
a stem positioned for longitudinal movement in said bonnet passageway and including a lower end portion extending into said chamber lower portion and being adapted to sealingly engage said valve seat to thereby open and close the valve,
said stem including an upper end portion extending above said bonnet,
a piston connected to said stem upper end portion, said piston including an outer cylindrical surface and an end portion,
a base connected to said bonnet in surrounding relation to said stem, said base having an end portion positioned in spaced relation with said piston end portion,
a cylindrical housing enclosing said piston and said base, said housing having an internal wall, said housing internal wall and said spaced apart piston end portion and said base end portion forming a fluid chamber between said piston and said base,
said piston outer cylindrical surface being longitudinally slidable on said housing internal wall,
a passageway extending through said housing internal wall and communicating with said fluid chamber for admitting and releasing pressurized fluid to and from said fluid chamber for reciprocating said piston to open and close the valve,
first seal means positioned between said base and said housing internal wall for maintaining a fluid-tight seal between said housing and said base,
second seal means positioned between said piston and said housing internal wall for maintaining a fluid-tight seal therebetween as said piston reciprocates in said fluid chamber,
said second seal means including an annular seal member having an inner edge and an outer edge,
said piston outer cylindrical surface having a recess,
said annular seal member inner edge positioned in said recess and said annular seal member outer edge positioned for slidable movement on said housing internal wall upon reciprocation of said piston,
said annular seal member being movable with said piston with said annular seal member inner edge being maintained in sliding sealing engagement with said housing internal wall to prevent escape of fluid upwardly through said housing between said piston and said housing internal wall,
a compression coil spring positioned on said stem and abutting said base at one end and acting on said stem at the other end, and
said coil spring exerting a force on said stem to normally maintain said stem lower end portion engaging said valve seat in the absence of fluid in said fluid chamber to exert an upward force on said piston to raise said stem and open the valve.

4,526,342

ACTUATOR DEVICE FOR A HYDRAULIC SPOOL VALVE

Donald C. Wakefield, deceased, late of Grantham, England (by June Wakefield, executrix), assignor to Kontak Manufacturing Co. Ltd., Grantham, England

Filed Dec. 22, 1982, Ser. No. 452,823
Int. Cl.³ F16K *31/04, 31/54;* F15B *13/044*
U.S. Cl. 251—131 **4 Claims**



1. A hydraulic spool valve assembly comprising:
a hydraulic spool valve and an actuation device for a spool valve;
said actuation device including:
an electric motor;
control means for actuating said motor;
a gear box having an input gear wheel driven by said motor and output means connected to the spool of said valve;
wherein said output means comprises a segmented rack and pitman pin, the segmented rack being driven by said input gear wheel and the pitman pin being connected directly to the rack and to the spool valve and connected directly to the spool valve such that rotation of the input gear wheel effects linear movement of the spool valve.

4,526,343

DEVICE FOR THE DISTRIBUTION OF A FLUID

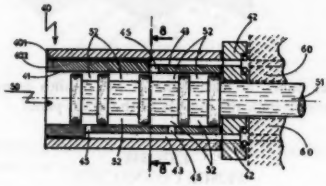
Guy d'Agostino, Vitry; André Dhainaut, Dammarie les Lys, and Jacques A. A. Petiteau, Le Chatelet en Brie, all of France, assignors to Society Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", France

Division of Ser. No. 434,169, Oct. 13, 1982, abandoned. This application Oct. 26, 1984, Ser. No. 665,078
Claims priority, application France, Oct. 19, 1981, 81 19573
Int. Cl.³ F16K *27/04*
U.S. Cl. 251—367 **3 Claims**

1. A fluid distribution device comprising:
(a) a generally cylindrical outer sleeve;
(b) a generally cylindrical inner sleeve concentrically attached to the outer sleeve, the inner sleeve having an outer surface which defines a plurality of generally longitudinal grooves

extending various lengths from one end of the inner sleeve so as to define, with the outer sleeve, at least fluid inlet and outlet passages, and an opening extending through the wall of the inner sleeve at the end of each groove so as to open into the interior of the inner sleeve;

(c) a mounting flange attached to the one end of the inner and outer sleeves, the flange defining a plurality of passages therethrough, each passage being aligned with a groove of the inner sleeve so as to communicate therewith;



(d) a valve spool slidably retained in the inner sleeve, the valve spool having a plurality of radially extending lands thereon; and,

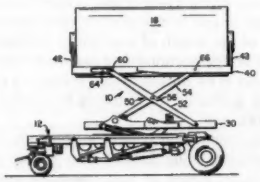
(e) means to move the valve spool along the longitudinal axis of the inner sleeve to at least two positions to control the fluid communication between the openings extending through the wall of the inner sleeve.

4,526,344

AUXILIARY LIFT ADAPTER

Norman D. Oswald; Robert R. Dean, both of Duncanville, and Harry S. Mankey, Dallas, all of Tex., assignors to Standard Manufacturing Co., Inc., Dallas, Tex.

Filed Sep. 28, 1982, Ser. No. 426,232
Int. Cl.³ B60P *1/48*
U.S. Cl. 254—9 C **8 Claims**



1. An auxiliary lift adapter for use with a primary lifting device having a lifting means of a predetermined width, to transport a load vertically through an opening having a lateral dimension which is less than the width of the lifting means of said primary lifting device, comprising:

a pair of parallel, normally horizontally disposed bottom load beams, the outer lateral surfaces of said bottom load beams being separated by a distance less than the width of the lifting means of said primary lifting device;

a plurality of cross frames interconnecting the bottom load beams;

a pair of parallel, normally horizontally disposed top load beams, said top load beams being positioned directly above said bottom load beams and having outer lateral surfaces which are separated by a distance less than the width of the lifting means of said primary lifting device;

a pair of scissors mechanisms for selectively raising and lowering the top load beams relative to the bottom load beams, each scissors mechanism comprising an exterior arm pivotally connected to its bottom load beam at one end and slidably connected to its top load beam at the other end, an interior arm pivotally connected to its top load beam at one end and slidably connected to its bottom load beam at the other end, and means pivotally interconnecting the arms substantially at the midpoints thereof;

a plurality of pickup adapters secured to said bottom load beams and extending laterally outwardly therefrom for supporting the auxiliary lift adapter and the load carried thereby by engaging the lifting means of said primary lifting device, wherein said pickup adapters hold the auxiliary lift adapter at a level lower than the level of the lifting means of said primary lifting device when in a lowered position;

a cross frame interconnecting the lower ends of the interior arms of the scissors mechanisms; and

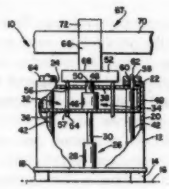
a pair of hydraulic cylinders each positioned adjacent one of the bottom load beams and beneath the cylindrical object when the auxiliary lift adapter is in its lowered position, each of the hydraulic cylinders being connected between one of the cross frames interconnecting the bottom load beams and the cross frame interconnecting the lower ends of the interior arms of the scissors mechanisms, said hydraulic cylinders for selective actuation to raise and lower the top load beams and the cylindrical object carried thereby relative to the bottom load beams.

4,526,345

DOUBLE LIFT JACK

George S. Schmidt, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 15, 1984, Ser. No. 610,451
Int. Cl.³ B66F *3/22*
U.S. Cl. 254—93 R **11 Claims**



1. A double lift jack comprising:

a housing;

said housing including a base supportable on a surface and at least one rigid vertical member extending upward from said base;

a first hydraulic jack disposed on said base;

said first hydraulic jack including means responsive to an application of a first pressurized hydraulic fluid thereto for producing a first vertical urging;

a platant;

means for permitting a first vertical motion of said platant in response to said first vertical urging between a first vertical position and a second vertical position;

a second hydraulic jack disposed on said platant;

a load base mounted on said second hydraulic jack;

said second hydraulic jack including means responsive to an application of a second pressurized hydraulic fluid thereto for producing a second vertical urging;

means in said platant for permitting a second vertical motion of said load base in response to said second vertical urging; and

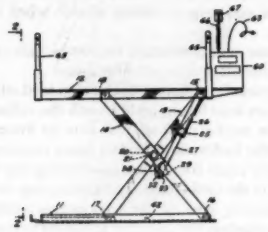
means for rigidly mechanically affixing said platant to said at least one rigid vertical member in at least one of said first and second vertical positions whereby said platant is stabilized by said at least one rigid vertical member in said at least one of said first and second positions such that the precision and the stability of said second vertical motion is improved independently of the precision and stability of said first hydraulic jack.

4,526,346

SELF-CONTAINED ELEVATING TABLE

James J. Galloway, Palos Verdes Estates, and Albert E. Blanchard, Temple City, both of Calif., assignors to G. W. Galloway Company, Inc., Baldwin Park, Calif.

Filed Jan. 18, 1982, Ser. No. 339,869
Int. Cl.³ B66F 3/22
U.S. Cl. 254—122 10 Claims



8. Lifting apparatus comprising:

a stationary base member and a platform member maintained parallel to one another by two sets of spaced apart scissor linkages each including a pair of legs pivoted to one another at their midlengths on a common axis, one pair of adjacent leg ends having roller means positioned to roll along said base and along said platform respectively as said legs open and close and the other ends of said legs being pivoted respectively to said base and to said platform;

power means for opening said legs from a closed position lying substantially parallel to one another, said power means including hydraulic cylinder means pivoted to a first roller-equipped end of elongated toggle lever means having its second end pivotally supported adjacent the outer end of a first one of a pair of said legs, and the midlength portion of a second one of said pair of legs being pivotally connected to the other end of said toggle lever means remote from roller-equipped end thereof;

said toggle lever means being pivotable between a first position substantially aligned with said second scissor leg and a second position against a stop mounted on said second leg whereat said toggle lever means lies at an acute angle to said second scissor leg; and

ramp means immovably fixed to said stationary base member and located in the path of movement of said roller-equipped end of said toggle lever means and operable upon the initial expansion of said cylinder means from the fully retracted position thereof to pivot said toggle lever means from said first position toward said second position thereof thereby to open said pairs of scissor linkages away from one another.

4,526,347

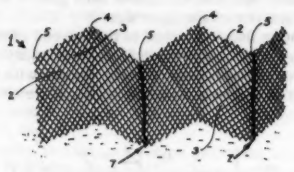
FENCE ASSEMBLY

Thomas P. McLoughlin, Dublin, Ireland, assignor to Institute for Industrial Research and Standards, Dublin, Ireland

Filed Jun. 7, 1982, Ser. No. 386,137
Claims priority, application Ireland, Jun. 9, 1981, 1273/81; Aug. 5, 1981, 1782/81; Jan. 13, 1982, 51/82; Feb. 9, 1982, 279/82; Apr. 20, 1982, 934/82
Int. Cl.³ B21F 27/00; E04H 17/02
U.S. Cl. 256—33 14 Claims

1. A fence assembly comprising:

a plurality of interlocking panels of semi-rigid net-like material arranged in zig-zag relationship, the panels being bent intermediate their side edges, the bend being well in from the side edges, each panel having a plurality of closed meshes and being joined to another panel by portion of at least some of the closed meshes of the panel adjacent a side edge thereof, projecting through closed meshes of the



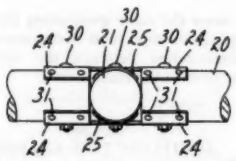
other panel, at least some of the meshes being bent to interlock with the meshes of the other panel.

4,526,348

FENCE CONNECTOR

Malcolm E. Cammack, 9052 140th St. North, Hugo, Minn. 55038

Filed Oct. 29, 1981, Ser. No. 316,113
Int. Cl.³ E04H 17/14
U.S. Cl. 256—65 9 Claims



1. A fence connector for connecting round wooden posts to round wooden rails, comprising:

a unitary sheet metal connector having a central bridge portion, a pair of connection flanges, one at each end of said bridge portion, and a second pair of connection flanges, one on each side of said central bridge portion and connected to said bridge portion by a short neck portion midway of the length of said bridge portion,

said central bridge portion being narrower than said connection flanges at its ends to bridge between a post and a rail, and being apertured for fastening to a said round wooden post or rail, and

each of said connection flanges at the ends of said central bridge portion being formed into an arc about an axis parallel to the length of said connector and each of said second pair of connection flanges being formed into an arc about an axis perpendicular to the length of said connector to generally conform to the periphery of a said round wooden rail or post, and each of said connection flanges being apertured for fastening to a said round wooden rail or post.

4,526,349

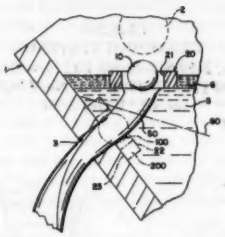
METHOD AND ARTICLE OF MANUFACTURE FOR CONTROLLING SLAG CARRY-OVER DURING TAPPING OF A HEAT IN STEELMAKING

John W. Schwer, 1349 Azalea Dr., Munster, Ind. 46321

Filed Dec. 13, 1983, Ser. No. 560,918
Int. Cl.³ B22D 41/10
U.S. Cl. 266—45 5 Claims

1. In a steelmaking process in which a layer of liquid slag is formed on the liquid steel in the steelmaking vessel during said process, whereafter at the completion of the heat said liquid steel is removed from said vessel through a side taphole, the improvement comprising the addition to said vessel prior to tapping of a spatially unconstrained, heat-stable material having a density such that said material floats substantially at the

interface between said slag and said steel and effects unrestricted spatial movement with respect to said interface and



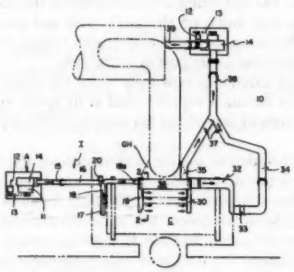
said taphole during tapping, said material being in the physical form of at least one annular disc.

4,526,350

WASTE GAS COLLECTION DEVICE

Salah Ghoneim, 1245 Elkhorn Cres., Prince George, B.C., Canada (V2M 6J2)

Filed Oct. 28, 1983, Ser. No. 546,526
Int. Cl.³ C21C *5/38*
U.S. Cl. 266—159 **16 Claims**



1. A waste gas scavenging device for use with converters having molten metal and chemical reagents contained therewithin, which molten metal and chemical reagents expel noxious gases to the environment, the converter having a mouth, the waste gas scavenging system comprising in combination:

means adjacent the mouth of the converter for extracting exhaust gases and ambient air from the environs of the mouth,

said extracting means adapted to route the exhaust gases to a site remote therefrom for subsequent processing,

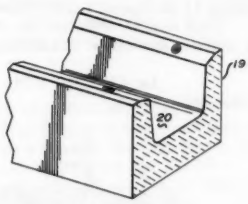
and means operatively associated with said exhaust extracting means so that said exhaust extracting means can operate in concert with rotation of the converter whereby the relationship of the mouth of the converter to said exhaust extracting means is the same during all angles of rotation of the converter including a source of incoming air and intake means disposed adjacent the mouth for providing air current flow from said intake means to said exhaust extracting means defining a push-pull system wherein said intake means includes means for allowing the relationship of said intake means relative to the converter mouth to remain constant during rotation of the converter wherein said exhaust extracting means includes a branch exhaust conduit disposed above a conventional stationary gas hood for extracting fumes which meander beyond the mouth of the converter wherein said further branch exhaust conduit communicates with said exhaust extracting means downstream thereof for subsequent processing in an area remote from the converter, said exhaust extracting means sharing scavenging cleansing facilities with the conventional gas hood wherein said intake means comprises a manifold having a plurality of openings, said manifold adjacent an edge of the converter mouth, said manifold communicating with a conduit system to a source of air wherein said conduit system includes a flexible section whereby rotation of the converter is met with concomitant deformation of said flexible conduit section wherein said exhaust extracting means includes an exhaust manifold disposed adjacent the edge of the converter diametrically opposite said intake means wherein said exhaust manifold communicates with an exhaust conduit section including a swivel connector integrally formed with an exhaust conduit system, and swivel connector allowing rotation of said exhaust conduit section on the converter relative to a stationary exhaust conduit, said swivel disposed on an axis coincident with the axis of rotation of the converter wherein said air intake means includes a bypass for selectively disabling said intake air means during certain phases of the converting process wherein said intake means includes a source of fluid pressure including a pump and a motor driving said pump through a belt means wherein said exhaust extracting means includes a pump to extract air and a motor to drive said pump operatively connected to said pump by a belt wherein said intake means includes a manifold of substantially elongate rectangular section formed as an arcuate conduit having the same radius of curvature as the converter, said rectangular section having a top wall, a bottom wall and a side wall, a face opposite said side wall provided with a nozzle opening wherein said nozzle opening includes a bottom wall, a pair of side walls and a downwardly declinated top wall inclined downwardly towards the converter mouth wherein said exhaust manifold includes an arcuate conduit having substantially rectangular cross-section including a top wall, a bottom wall, a side wall, a side opposite said side wall provided with a wall brace and an opening, whereby air pressure causes exhaust gases to enter therein including baffle means in said exhaust extracting means to alter flow rate therethrough as a function of converter position.

4,526,351

SLAG AND HOT METAL RUNNER SYSTEM

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Continuation-in-part of Ser. No. 447,408, Dec. 6, 1982. This application Apr. 2, 1984, Ser. No. 595,724
Int. Cl.³ F27D *3/14*
U.S. Cl. 266—196 **15 Claims**



1. In a runner system for conveying molten slag across a pouring floor from a source of molten slag to a pouring point, the runner system including a trench means in the pouring floor for containing molten slag, the trench means including sides and a bottom, an improvement in combination therewith comprising:

a replaceable liner means located in the trench means for forming a replaceable channel in the trench means, said replaceable liner means including a plurality of monolithic units, each monolithic unit having a bottom portion and

wall portions, said wall portions being in abutting relationship with the trench means sides and said bottom portion resting on the trench means bottom and extending completely across the trench means bottom between said liner means wall portions whereby the trench means reinforces said monolithic unit;

said monolithic units being unattached to each other or to the trench means to line the trench means with a plurality of unconnected and unattached monolithic units whereby any one of said plurality of monolithic units can be removed from the trench means without significantly disturbing either the trench means or any other monolithic unit.

4,526,352

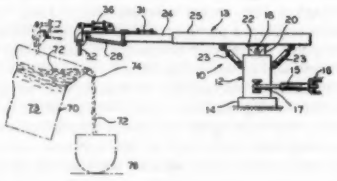
DESLAGGING RAKE

Stephen J. Roper, Youngstown, Ohio, assignor to Pennsylvania Engineering Corporaton, Pittsburgh, Pa.

Filed Mar. 23, 1984, Ser. No. 592,884

Int. Cl.³ F27D *7/00*

U.S. Cl. 266—228 **7 Claims**



1. A deslagging rake comprising:

a main boom section,

an auxiliary boom section mounted at the end of the main boom section for pivotal movement about a substantially vertical axis,

said auxiliary boom section being shorter than said main boom section,

a rake mounted at the opposite end of said auxiliary boom section for pivotal movement about a substantially horizontal axis,

first and second motive means selectively coupled to said auxiliary boom section and said rake for pivoting the same about their respective pivotal axes.

4,526,353

SAFETY DEVICE FOR THE COVER OF A METALLURGICAL VESSEL

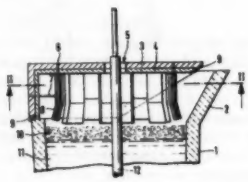
Hubert Stomp, 11 rue Speyer, L-2545 Howald, Luxembourg

Filed Nov. 16, 1983, Ser. No. 552,392

Claims priority, application Luxembourg, Nov. 19, 1982, 84481

Int. Cl.³ C21C *5/00*

U.S. Cl. 266—282 **29 Claims**



1. A safety device for protecting the cover of a metallurgical vessel having a metal bath therein, the cover resting on or hanging over the edge of the vessel, the cover having an upper portion and a side portion including:

a plurality of individually replaceable adjacent segments depending from within said cover, said adjacent segments overlapping each other whereby said metal bath is prevented from splashing against said vessel edge.

4,526,354

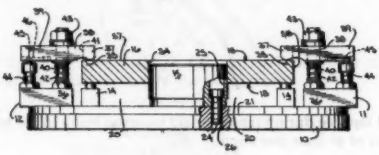
CLAMPING SYSTEM

Paul M. Mannes, 2450 S. Graylog Ln., New Berlin, Wis. 53151

Filed Feb. 13, 1984, Ser. No. 579,303

Int. Cl.³ B23Q *1/00*

U.S. Cl. 269—93 **1 Claim**



1. In a clamp for clamping a work piece to a work station, of the type wherein a front edge of a clamp bar projects over a peripheral edge of the work piece and is tightened down onto the work piece, the improved clamp comprising:

a clamp base attachable to the work station;

a guide post extending upward from the clamp base and through a middle portion of the clamp bar, said clamp bar having an elongated slot through which the guide post extends, the slot being suitable to allow the clamp bar to slide up and down on the guide post and also allow the clamp bar to move transversely with respect to the guide post while the guide post is in the slot;

a heel post extending upwardly from the clamp base, the heel post having a support head at its upper end;

a rear portion of said clamp bar resting on the support head; and

a cammed undercut on the underneath of the clamp bar which slopes downwardly towards the front edge of the clamp bar whereby upon a tightening down of the clamp bar on the work piece, the cammed undercut exerts a force on the clamp bar due to sloping contact of the undercut against the heel post which resists to some extent opposing lateral force exerted by the work piece on the front edge of the clamp bar.

4,526,355

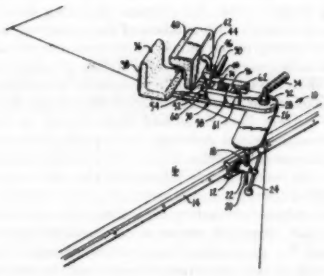
ARTHROSCOPIC LEG HOLDER

Robert R. Moore, 4010 East Ave., Hayward, Calif. 94545, and Steve R. Lamb, 2272 Sydney Way, Castro Valley, Calif. 94546

Filed Sep. 29, 1982, Ser. No. 427,498

Int. Cl.³ A61G *13/00*

U.S. Cl. 269—328 **11 Claims**



1. An arthroscopic leg holder for an operating table comprising an elongated support member with first and second ends

having a mounting means connected at said first end for mounting the support member over the operating table and a first pad fixed at said second end for support of a patient's leg;

a. a slide unit having slide connection means connecting said slide unit to said support member for linear hand transport of said slide unit toward and away from said first pad, said slide unit having a second pad positioned on said slide unit with respect to said first pad wherein said first and second pads substantially circumferentially engage the patient's leg when said second pad is displaced toward said first pad, said second pad having a pad support post adjustably engageable with a locking socket, mounted to said slide unit wherein said post is telescopically and pivotally engageable in said socket for elevationally and angularly positioning said second pad with respect to said first pad; and

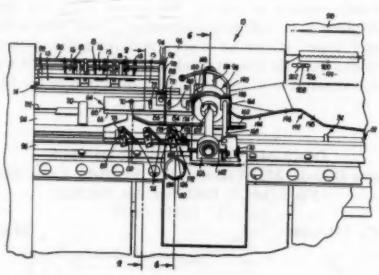
b. locking means for locking said slide unit in a selected fixed location on said support member with a direct hand determined clamping pressure of said first and second pads against a patient's leg, wherein said locking means comprises a selective engagement means for permitting free sliding of said slide unit toward said first pad and preventing sliding of said slide unit away from said first pad, said on manual activation of said selective engagement means comprising a pawl connected to said slide unit and a rack connected to said support member, said pawl having a detent engageable with said rack, and, a release means for permitting free sliding of said slide unit away from said first pad release means.

4,526,356

INSERT MECHANISM FOR FLEXIBLE MULTIPLE SHEET TABLOID AND ADVERTISING PUBLICATIONS

Ronnie K. Swint, Emporia, Kans., assignor to Kansa Corporation, Emporia, Kans.

Filed Aug. 15, 1984, Ser. No. 641,059
Int. Cl.³ B65H *5/30*
U.S. Cl. 270—55 **16 Claims**



1. A mechanism for opening a rectangular folded paper section, wherein the section comprises a plurality of folded, substantially identically-sized flat sheets of paper, the sheet being folded within the next contiguous sheet such that a common center fold is produced, said mechanism comprising:

a transport device for substantially horizontal movement of the paper section in an advancing direction generally parallel to the longitudinal axis of the center fold;

an elongated pin with a pointed end;

means for mounting the pin in disposition for movement through an arc, such that the pin is located to penetrate a portion of the sheets on the leading corner of the section remote from said fold as said leading corner approaches the pin, and to thereafter lift said portion of the sheets engaged by the pin as the section is advanced by the transport device;

means coupled to said pin for moving the latter relative to said transport device in timed relationship with advancement of the section;

stripper means for stripping said portion of the sheets from the pin after said portion is lifted; and

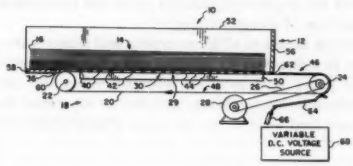
means for holding the stripped portion released from said pin at a position away from the remaining sheets of the section, permitting additional sheets of paper to thereafter be inserted within the opened section between said portion and said remaining sheets.

4,526,357

ELECTRO-STATIC SHEET FEEDING METHOD AND APPARATUS

Manfred R. Kuehnle, New London, N.H.; Robert M. Rose, Sudbury, and John S. Ballas, Newton, both of Mass., assignors to Coulter Systems Corporation, Bedford, Mass.

Filed Jan. 3, 1983, Ser. No. 455,067
Int. Cl.³ B65H *3/16*
U.S. Cl. 271—18.2 **16 Claims**



1. Apparatus for withdrawing at least one sheet from a stack of said sheets and feeding the same to a selected location comprising:

(A) a translatable member having a substantially planar surface portion selectively adapted to be closely arranged to one of the top-most and bottom-most sheets of said stack, the member being translatable in a plane substantially parallel to the plane of the sheets of said stack from a position adjacent said stack to said selected location,

(B) said surface portion carrying fixed electrodes adapted to be directly exposed to said stack, but electrically insulated one from the other and constructed and arranged to form grid means which can be energized to provide a plurality of electric fields extending between said electrodes only a short distance normal to said surface portion; and

(C) means for connecting said grid means to a D.C. voltage source for selectively energizing said grid means continuously from when said translatable member is adjacent the stack, so that said electrical fields operate to withdraw at least one sheet, until delivery of said at least one sheet to said selected location by the movement of said member, said at least one sheet so delivered being free of residual electrical charges thereon due to said exposed electrodes.

4,526,358

PAPER FEEDING MECHANISM

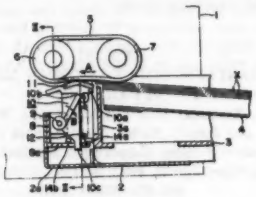
Hiroaki Ura, and Shogo Kato, both of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 383,743
Claims priority, application Japan, Jun. 9, 1981, 56-88472; Jun. 9, 1981, 56-88473; Jun. 9, 1981, 56-88474
Int. Cl.³ B65H *3/04*
U.S. Cl. 271—34 **7 Claims**

6. A paper sheet feeding mechanism comprising a feed base upon which a cassette that carries a plurality of sheets to be fed can be installed by a forward movement, from which the cassette can be removed by a rearward movement, and by which an installed cassette is supported in a predetermined position, an orbitally movable paper feed member mounted above a first portion of said feed base for engaging sheets of paper in an installed cassette to feed them forwardly, and a retarding member beneath said paper feed member and cooper-

able with it to prevent forward feed of sheets below one that is directly engaged with the paper feed member, said sheet feeding mechanism being characterized by:

A. a reciprocating member mounted on said feed base and having at one end thereof said retarding member and at the other end thereof an engaging member which can be engaged with a portion of the cassette, whereby said



retarding member is maintained in a position to engage with the paper feed member upon the completion of the insertion of a cassette, and

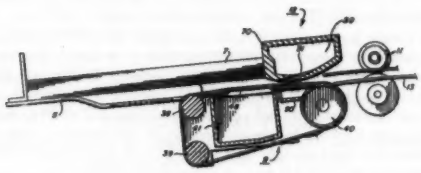
B. biasing means at all times urging said reciprocating member in a direction to separate said retarding member from the paper feed member whereby when the cassette is removed the retarding member is separated from the paper feed member by the force of said biasing means.

4,526,359

DUAL JET BOTTOM VACUUM CORRUGATION FEEDER

Gerald M. Garavuso, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1983, Ser. No. 490,053
Int. Cl.³ B65H *3/12*
U.S. Cl. 271—94 **6 Claims**



1. A bottom sheet separator-feeder apparatus for separating and forwarding sheets in seriatim, comprising:

support means for supporting a stack of sheets;

first air knife means positioned adjacent the front of said stack of sheets;

diffusion means in communication with said air knife means to present a low velocity/high pressure profile to said stack of sheets to levitate the sheets above said support means;

vacuum means adapted to attract and corrugate the bottommost sheet from said stack of sheets;

a plurality of belt means entrained over said vacuum means for forwarding individual sheets from said stack of sheets for further processing; and

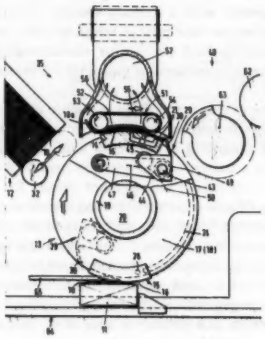
second air knife means positioned between said plurality of belt means and adapted to apply positive pressure to the front of said stack of sheets to insure separation of the bottommost sheet from the next adjacent sheet.

4,526,360

PROCESS AND APPARATUS FOR FEEDING BANDS TO A PACK

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,524
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131268
Int. Cl.³ B65H *3/52*
U.S. Cl. 271—122 **12 Claims**



1. A method for feeding sheet shaped blanks to an article comprising the following method steps:

extracting the said blanks from a magazine (12) at a first point, if more than one blank is erroneously extracted, together they comprise a lowest blank (10) and an upper erroneous blank or blanks,

holding said blanks to a blank-conveyor (13) by a first suction means and a mechanical means,

conveying the blanks in a first direction to a second point,

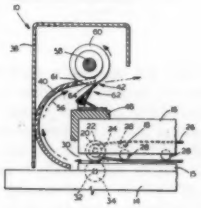
at the second point, separating and lifting off the upper blanks resting on top of the lowest blank by laterally displacing, in a direction opposite to said first direction, said upper erroneous blanks and removing said upper blanks from the lowest blank by suction applied in a direction transverse to the conveying direction of the blanks.

4,526,361

DOCUMENT TURNOVER DEVICE

R. Clark DuBois, 332 Wakeman Rd., Fairfield, Conn. 06430

Filed Dec. 7, 1983, Ser. No. 558,951
Int. Cl.³ B65H *29/00*
U.S. Cl. 271—186 **23 Claims**



1. A document turnover device for use in combination with a copying apparatus or the like having a document feeding mechanism for the documents being copied including a discharge means for moving the document being copied in a first orientation through the exit end of the document feeding mechanism, comprising:

A. a housing adapted to be mounted on the associated copy-

ing apparatus adjacent the exit end of the its document feeding mechanism;

B. deflecting means on said housing to deflect and guide a document exiting from the exit end of the associated document feeding mechanism in a document feed path from the first orientation to its reverse orientation;

C. turnover drive means in said housing for capturing the document in said document feed path while the document still is engaged by the discharge means of the associated document feeding mechanism and for driving the document after the document is released from the discharge means of the associated document feeding mechanism, said turnover drive means including a roller means rotatably mounted relative to said housing and nip forming means cooperating with said roller means to form a nip in said document feed path defined by said deflecting means;

D. motor means on said housing for rotating said roller means;

E. circuit means for said motor means adapted to be electrically connected to the associated copying apparatus for supply of power to said motor means concurrently with operation of the associated document feeding mechanism; and

F. means associated with said turnover drive means controlling forces acting on a document in said nip to allow a document to be driven faster by the discharge means of the associated document feeding mechanism than by said turnover drive means.

4,526,362
METHOD AND APPARATUS FOR STORING PARTIALLY OVERLAPPING SHEETS OF PAPER OR THE LIKE

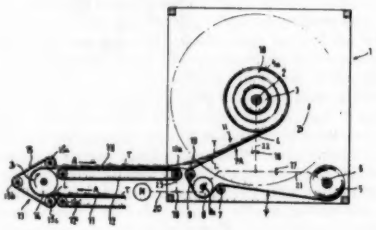
Hans Thierstein, Wiler near Utzenstorf, Switzerland, assignor to GRAPHA-Holding AG, Hergiswil, Switzerland

Filed Jun. 18, 1982, Ser. No. 389,981

Claims priority, application Switzerland, Jul. 15, 1981, 4633/81

Int. Cl.³ B65H *29/66*

U.S. Cl. 271—186 **9 Claims**



1. A method of storing sheets, which are supplied in the form of a stream containing a succession of partially overlapping sheets wherein the leaders of the next-following sheets overlie the trailing portions of the preceding sheets, between the convolutions of a flexible band, comprising the steps of coiling the band onto a rotary core including conveying successive increments of the band from a level below and upwardly toward the core so that the band is converted into a succession of convolutions which overlie each other; feeding successive sheets of the stream into the range of said successive increments of the band so that the sheets are confined between the convolutions of the band on the core; and inverting successive sheets of the stream ahead of the location where the sheets reach the band, comprising turning successive sheets upside down so that the leader of each next-following sheet is overlapped by the trailing portion of the preceding sheet.

4,526,363
GRIPPER FOR TEXTILE CLOTH OR THE LIKE

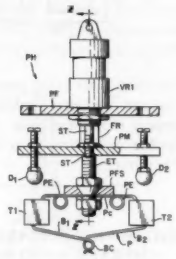
Jacques Fort, Darnieulles, France, assignor to Sapivog, Darnieulles, France

Filed Mar. 2, 1983, Ser. No. 471,496

Claims priority, application France, Mar. 19, 1982, 82 04706

Int. Cl.³ B65H *3/22, 5/14*

U.S. Cl. 271—268 **8 Claims**



1. A gripping apparatus for gripping individual sheets of flaccid material, comprising:

a pair of gripping jaws which are normally in a closed position, adapted in said closed position for gripping a sheet of flaccid material;

said pair of gripping jaws being resiliently supported by respective first arms; each said first arm being fixedly connected to a key member;

each said key member having a contact surface thereon adapted to be engaged by a finger member;

each said key member being fixedly connected to a first portion of a resiliently deformable member;

each said resiliently deformable member having a second portion which is fixedly connected to a support member;

a pair of finger members, each respective one of said finger members being selectively movable toward said contact surface of a respective said key member;

means for moving said pair of finger members toward said contact surfaces of said key members to move said key members and to thereby cause deformation of said resiliently deformable members;

whereby said pair of gripping jaws are normally in a closed position, said pair of gripping jaws being selectively operable by movement of said key members which is caused by selective movement of said finger members toward said keys by said means for moving said finger members, in turn causing said first arms to move relative to one another to cause said pair of gripping jaws to move to an open position.

4,526,364
SHEET FEEDING MECHANISM FOR DUPLICATING MACHINE WITH DUPLEXING CAPABILITY

Robert H. Evans, Palatine; Charles H. Espersen, Hoffman Estates, and John W. Tsai, Schaumburg, all of Ill., assignors to AM International, Inc., Chicago, Ill.

Filed Mar. 17, 1983, Ser. No. 476,446

Int. Cl.³ B65H *5/02*

U.S. Cl. 271—272 **3 Claims**

1. A sheet material handling mechanism for use in a duplicating machine or the like, comprising:

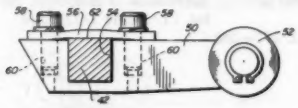
pressure roller means for engaging a first side of a sheet;

feed roller means for forming a nip with the pressure roller means through which the sheet is fed;

a support shaft extending generally parallel to and spaced from said pressure roller means, said support shaft being polygonal in cross section; and

support means for mounting said feed roller means on said support shaft, said support means having a polygonal

through hole complementary to and for receiving the support shaft, including clamp means forming one side of said polygonal through hole for clamping engagement with one side of the polygonal support shaft and a cut-out



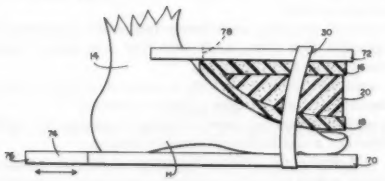
forming the other sides of the polygonal through hole, the depth of the cut-out being slightly less than the thickness of the support shaft, and said clamp plate being sufficiently flexible to deform over the support shaft when clamped thereover.

4,526,365

EXERCISING DEVICE SUITABLE FOR PHYSICAL THERAPY AND THE LIKE

Zelik Ziegelbaum, 6787 Booth St., Apt. 2G, Forest Hills, N.Y. 11376

Filed Mar. 18, 1983, Ser. No. 476,721
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—96 **8 Claims**



1. An exercising device comprising first and second relatively planar members, and resilient means between said planar members and constituting a compression member to yieldingly resist the forcing of the planar members together, the planar member being connected together at an angle and as a monolithic structure, a strap encircling the planar members and resilient means to hold the same in sandwiched relation said exercising device further comprising a third planar member and coupling means to couple said third planar member in rearwardly spaced relation to said second planar member whereby the foot of an operator can be accommodated on the first planar member and the heel of the foot can be accommodated on said third planar member.

4,526,366

ELECTRONIC WATER EJECTING GAME

Robert Kenoun, 7043 Wilson Ter., Morton Grove, Ill. 60053

Filed Aug. 27, 1982, Ser. No. 412,305
Int. Cl.³ A63B *71/06*
U.S. Cl. 273—1 GC **13 Claims**

1. A game adapted to be played by at least one player; said game comprising:

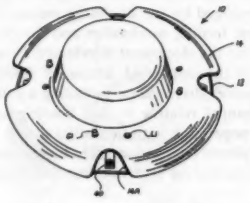
a housing; indicator means for displaying game information to said player;

means for ejecting fluid toward a player;

means arranged to determine a set of game rules, said game-rule-determining means including logic means operable to control said indicator means;

manually operable means adapted to be actuated by said at least one player, acting in response to said game information for sending information to said logic means according to said game rules; wherein said manually operable means may comprise a switch means at each of a plurality of player locations;

said logic means being arranged to cause said ejecting means to eject fluid toward said player when said player fails to activate said manually operable means according to said game rules;



said means for ejecting fluid including an ejection valve at each of a plurality of player positions;

means to warn, attack, and defend each player position, wherein said means to attack is ejection of fluid;

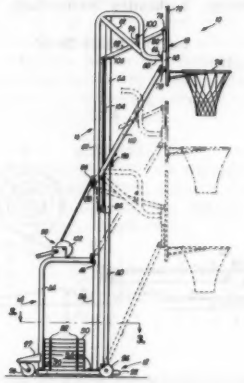
said housing rotatably secured such that the means to warn can be aligned with a different player position than the position under attack.

4,526,367

PORTABLE BASKETBALL GOAL

James E. Haston, 119 Johnston Pkwy., Raymore, Mo. 64083, and Anthony D. Orloff, 1023 Monroe, Kansas City, Mo. 64127

Filed Oct. 17, 1983, Ser. No. 542,895
Int. Cl.³ A63B *63/08*
U.S. Cl. 273—1.5 R **7 Claims**



3. In a portable basketball goal unit provided with a backboard and goal assembly which may be selectively shifted to a regulation playing height, an intermediate position for younger players and a lower position for storage of the unit, the combination of:

a movable base;

an upright frame carried by said base;

a shiftable backboard subframe adjustably mounted on said frame for vertical movement relative thereto;

an upright mounting frame secured to the normally rearmost face of said backboard;

means adjustably connecting the uppermost part of said subframe to said mounting frame for vertical shifting of said backboard relative to said subframe, and

manually operable means coupled to said subframe and to

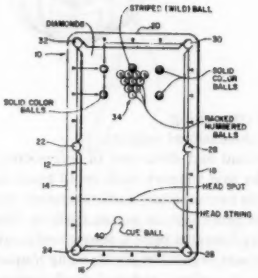
said mounting frame for raising and lowering said backboard as said subframe is shifted vertically with respect to said frame and for cooperatively effecting raising and lowering of said backboard with respect to the same subframe in a manner such that after the backboard has been raised a certain distance, the subframe is thereafter raised relative to the frame and visa-versa during lowering of the assembly.

4,526,368

GAME APPARATUS

John G. Furda, 1031 W. 17th Place, Lakewood, Colo. 80215

Filed Jul. 31, 1984, Ser. No. 636,382
Int. Cl.³ A63D *13/00*
U.S. Cl. 273—14 **4 Claims**



1. Apparatus for playing a game wherein a set of object balls of different colors and markings and numbers are selectively driven into pocket areas on a flat playing surface and a cue ball adapted to be struck with a hand-held device such as a cue stick or a mallet, and the apparatus comprising:

a cue ball of white color;

a ball having a distinctive marking, which is distinctive from any other ball of the set and used as a wild card type ball to be selectively counted as any number from 1 to 10;

a first group of four solid color balls without numbers and with two of said group being of the same distinctive color different from the color of any other balls of the set and two of the group being of the same distinctive color different from the color of any of the other balls of the set; and

a second group of ten numbered balls with nine of the balls having each one of the numbers 1 through 9 marked thereon and another one of the group of numbered balls having a second number 5 marked thereon and with the number 1 and number 9 balls having the same distinctive color different from the color of any other balls of the set, the number 2 and the number 8 balls having the same distinctive color different from the color of any other balls of the set, the number 3 and number 7 balls having the same distinctive color different than the color of any other balls of the set, the number 4 and number 6 balls having the same distinctive color different than the color of any other balls of the set and the two number 5 balls having the same distinctive color different than the color of any other balls of the set.

4,526,369

GOLF AID

Paul E. Phelps, 5 Bronson Ave., Searsdale, N.Y. 10583

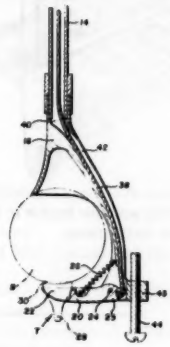
Filed Apr. 8, 1983, Ser. No. 483,294
Int. Cl.³ A63B *57/00*
U.S. Cl. 273—32 B **17 Claims**

1. Golf aid for setting a golf ball and a tee in driving position on the ground, wherein the tee consists of a relatively narrow shank portion for insertion into the ground and a relatively enlarged head portion for supporting the golf ball, the golf aid comprising:

(a) a housing having a downwardly facing concave ball seat and having a lower portion which extends below said ball seat,

(b) an elongated shaft extending upwardly from the housing,

(c) a tee supporting finger located below and spaced from said ball seat, said finger having an open ended slot which is wide enough to receive the shank portion of the tee and which is narrower than the head portion of the tee for supporting the tee in the upright position, said finger being pivotally mounted on the housing at a fixed point on the



lower portion of the housing so that the slot is swingable toward and away from said ball seat,

(d) biasing means for urging said finger upwardly toward said ball seat so that the head portion of a tee which is placed in the upright position in said slot is urged against a ball which is placed in said ball seat, whereby said shank portion can be pushed into the ground by applying a downward force on the shaft, and

(e) actuating means for moving said finger away from said ball seat and away from its supporting relationship with the tee so that the golf aid can be removed from the ball and tee.

4,526,370

POWER BILLIARD CUE ADAPTOR

Robert J. Mortellacci, c/o J. H. Steinberg, 2631 E.W. Hwy., Chevy Chase, Md. 20815

Filed Jun. 4, 1984, Ser. No. 617,330
Int. Cl.³ A63D *15/08*
U.S. Cl. 273—69 **2 Claims**

1. An aluminum billiard cue stick comprised of two sections, an upper solid section which is screw attached to a lower section which comprises an adaptor that is a hollow tubular section, which can be used with any two sectioned cue stick,

containing a steel rod having about 25 saw teeth surrounded by a long force spring which is preceeded by a short bumper

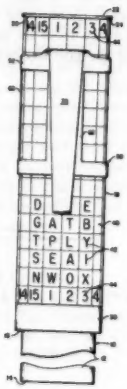
spring and including a simple button to be pushed for locking and release of said force spring.

4,526,371

SPELLING GAME

Arthur P. Venditti, 2 Seneca Rd., Peabody, Mass. 01960

Filed Mar. 11, 1983, Ser. No. 474,508
Int. Cl.³ A63F *9/00*
U.S. Cl. 273—148 R **22 Claims**



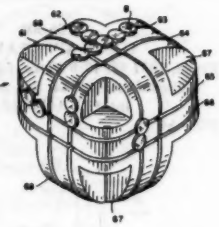
13. A spelling word game comprising:
a generally cylindrical surface;
a columnar grid of letters arranged in a plurality of generally even circular rows of side-by-side letters about said cylindrical surface; and
a tubular cursor rotatably and axially slidable along and around said cylindrical surface, said tubular cursor including at least one longitudinal slot which functions as a window for viewing a group of letters.

4,526,372

PUZZLE TOY

Evangelos T. Kikis, 143-57 Rose Ave., Flushing, N.Y. 11355

Division of Ser. No. 341,061, Jan. 20, 1982, abandoned. This application Feb. 3, 1983, Ser. No. 463,649
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **2 Claims**



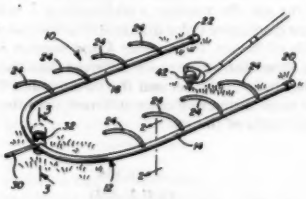
2. A game comprising:
a. A three-dimensional support;
b. first, second and third sets of intersecting track means carried by said support, each set of track means comprising at least two separate, endless courses, said first, second and third sets of track means lying in first, second snd third sets of parallel planes, respectively, said first, second and third sets of parallel planes being mutually perpendicular to one another, and said track means intersect one another to provide at least 24 points of intersection; and
c. a plurality of movable game pieces operatively associated with each said track means for movement along the courses defined by said track means, said game pieces occupying substantially the entire extent of said track means; said track means being operable to allow a game piece to be selectively moved through a point of intersection between two said track means and to transfer from one course to another or to remain on its original course.

4,526,373

GOLF CLUB SWING TRAINING DEVICE

Alfred A. Medlock, P.O. Box 627, Ocean Springs, Miss. 39564

Filed Aug. 17, 1983, Ser. No. 523,881
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—186 R **13 Claims**



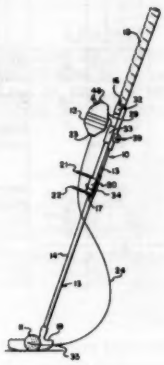
7. A golfing aid comprising a U-shaped member with elongate limbs spaced apart a distance sufficient to accommodate a golf club head therebetween and a plurality of flexible fingers spaced lengthwise of each limb so that when the member is placed on the ground the fingers extend upwardly from the limbs.

4,526,374

GOLF PRACTICE DEVICE

Thomas E. Ban, 1156 Berwick La., South Euclid, Ohio 44121

Filed Jun. 4, 1984, Ser. No. 616,847
Int. Cl.[3] A63B *69/36*
U.S. Cl. 273—194 R 17 Claims



1. A portable golf practicing device, comprising:

(a) an elongated bracket for positioning longitudinally of the shaft of a golf club, the bracket having a pair of longitudinally spaced opposing ends;

(b) at least one eyelet carried by the bracket adjacent the opposing end of the bracket closest the head of the club when the bracket is positioned on the club shaft;

(c) a reel having a continuous line reeled thereon and payable therefrom, the reel being carried by the bracket adjacent the other opposing end of the bracket closest the handgrip of the club when the bracket is positioned on the club shaft, the reel and eyelet being in general alignment longitudinally of the bracket, so that the line will extend in a relatively straight line through the eyelet;

(d) a hitable ball secured to the free end of the line extending beyond the eyelet; and

(e) means for detachably mounting the bracket longitudinally of the shaft of a golf club next to the handgrip of the club, the length of the bracket being such that the terminal eyelet, closest the club head, is spaced from the club head a distance which is at least one-half the length of the shaft between the club head and handgrip, when the bracket is mounted on the shaft next to the handgrip.

4,526,375

GOLF BALL

Shinichi Nakade, Itami, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Jan. 20, 1984, Ser. No. 572,472
Claims priority, application Japan, Jan. 22, 1983, 58-9217
Int. Cl.[3] A63B *37/02, 37/12*
U.S. Cl. 273—235 R 5 Claims

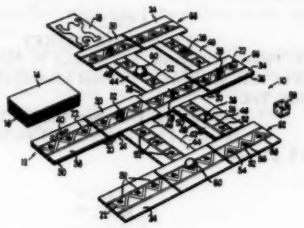
1. A golf ball consisting essentially of a core and a cover, said cover being made of a cover composition prepared by kneading a composition comprising an ionic copolymer of units of ethylene and units of an unsaturated monocarboxylic acid, a part of the unsaturated monocarboxylic acid units being in the form of sodium salt, and 0.1 to 3.0 parts by weight of a metal oxide per 100 parts by weight of said ionic copolymer at a temperature of 120° to 250° C. to react the ionic copolymer with the metal oxide, wherein the metal oxide is at least one member selected from the group consisting of magnesium oxide and zinc oxide.

4,526,376

GAME WITH CARDS

Donald A. Rosenwinkel, Oak Park; Jeffrey D. Breslow, Highland Park, and John V. Zaruba, Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 3, 1983, Ser. No. 463,635
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—249 8 Claims



1. A method of playing a game with cards, a chance device and a token for each of at least two players on a playing surface comprising the steps of:

initially placing at least one card on the playing surface to establish a base;

establishing a goal on the playing surface remote from the initially placed card;

providing each of the players with at least one of the remaining cards to place in a turn;

each player in turn placing a card adjacent or covering a card already placed on the playing surface, operating the chance device, and moving the token on the cards placed on the playing surface in accordance with indicia on the cards;

placing the cards on the playing surface to build a path from the base to at least a predetermined level;

positioning the goal adjacent the first card reaching the predetermined level;

increasing the path beyond the predetermined level by placing additional cards on the playing surface; and

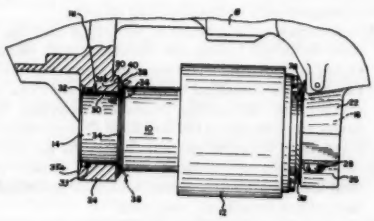
moving the goal to adjacent the first card on the increased level.

4,526,377

TURN-OVER SEAL

Richard A. Hale, Downers Grove; Nils O. Olsson, Glen Ellyn, and Thomas F. Reiff, Bridgeview, all of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Sep. 6, 1983, Ser. No. 529,298
Int. Cl.[3] F16J *15/56*
U.S. Cl. 277—9 8 Claims



1. A ring seal for protecting a designated area from ambient contamination and pivotable between first and second positions at will;

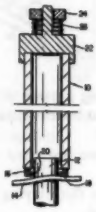
said ring seal comprising a lower portion and upper portions;

said lower portion being removably embedded in a tubular member adjacent and designated area;
said upper portion being freestanding and freely moveable from side-to-side between said positions;
said ring seal baring said designated area in said first position and sealing said area in said second position; and
retaining means for keeping said seal in said positions located near said designated area.

4,526,378
FILTER TUBE GASKET

Don J. Fisher, Colleyville, and Donald F. North, Carrollton, both of Tex., assignors to Peerless Manufacturing Company, Dallas, Tex.

Filed Jun. 11, 1984, Ser. No. 619,355
Int. Cl.³ F16J *15/10*; B01D *46/00*
U.S. Cl. 277—12 **3 Claims**



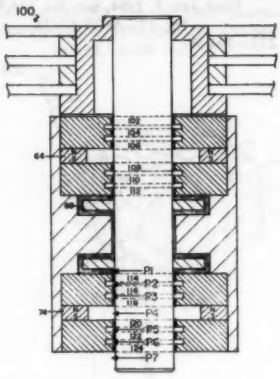
1. A filter tube assembly for sealingly mating with a nested support tube having a depending sealing ring surface, comprising:
a filter tube having a front end and a rear end;
a cap for sealingly supporting said front end,
urging means bearing against said cap for biasing said rear end toward said sealing ring surface,
a gasket having a first portion molded to said filter tube rear end and a second portion having a first sealing surface in facing relationship with said sealing ring surface and terminating in an extending lip for sealingly engaging said nested support tube.

4,526,379
STABILIZED FERROFLUID-FERROFLUID SEAL APPARATUS AND METHOD

Kuldip Raj, Merrimack, N.H., assignor to Ferrofluidics Corporation, Nashua, N.H.

Filed Jan. 9, 1984, Ser. No. 569,190
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—80 **19 Claims**

1. A stabilized ferrofluid-ferrofluid interface seal system which comprises:
(a) a magnetically permeable shaft element;
(b) a ferrofluid sealing means to provide at least one magnetized ferrofluid O-ring seal about the shaft element, the O-ring seal retained about the shaft element by a magnetic flux field, the ferrofluid O-ring seal having a one side and another side, the sealing means characterized by a gas cavity and one side of the ferrofluid O-ring seal forming a magnetized ferrofluid-gas interface in the gas cavity;
(c) a ferrofluid reservoir means to contain a source of ferrofluid and to provide a direct source of ferrofluid to the magnetized ferrofluid O-ring seal;
(d) unmagnetized ferrofluid in the reservoir means which forms an unmagnetized ferrofluid-magnetized ferrofluid interface with the other side of the ferrofluid of the O-ring seal; and
(e) means to maintain a pressure difference across the ferrofluid-ferrofluid interface to stabilize the ferrofluid-ferrofluid interface, by controlling the pressure in the gas cavity, the pressure in the gas cavity greater than the pressure on

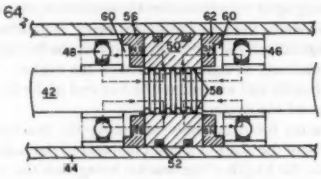


the ferrofluid-ferrofluid interface and less than the burst pressure of the ferrofluid O-ring seal.

4,526,380
SINGLE POLE PIECE MULTIPLE-STAGE FERROFLUID SEAL APPARATUS

Kuldip Raj, Merrimack, and Hanumaiah L. Gowda, Nashua, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed Jan. 27, 1984, Ser. No. 574,358
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—80 **13 Claims**



1. A single pole piece multiple-stage ferrofluid seal apparatus which comprises:
(a) a magnetically permeable rotary shaft element;
(b) a non-magnetic permeable housing through which housing the shaft element extends;
(c) an annular axially-polarized permanent magnet in the housing and having a one and another end and the annular permanent magnet surrounding the surface of the shaft element;
(d) a single pole piece having a one and another end, one end in a magnetic flux relationship with the one end of the permanent magnet and the other end of the pole piece extending into a close, non-contacting relationship with the surface of the shaft element and the one end of the single pole piece or the surface of the shaft element defining a plurality of separate edges which define a plurality of separate spaced apart radial gaps;
(e) a magnetically permeable bearing means to support the shaft element, the bearing means directly adjacent to and in a magnetic flux relationship with the other end of the permanent magnet;
(f) ferrofluid retained in the plurality of the radial gaps by the magnetic flux from the permanent magnet to form a

plurality of spaced apart separate ferrofluid O-ring seals about the surface of the shaft element; and

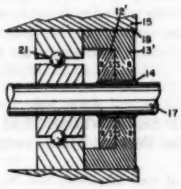
(g) the magnetic flux circuit passing between the permanent magnet, the single pole piece, the radial gaps, the shaft, and the adjacent bearing means to provide a single pole piece multiple-stage ferrofluid seal apparatus.

4,526,381

MAGNETIC DISC LIQUID SUPPORTING

Frederick D. Ezekiel, 75 Allen St., Lexington, Mass. 02173

Filed Jan. 31, 1984, Ser. No. 575,514
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—80 **14 Claims**



1. Magnetic sealing apparatus comprising,

first and second thin permanent magnet means each characterized by a cross section having a thickness dimension between opposed end faces of the magnet means that is smaller than a height dimension thereof and magnetized along an axis parallel to said thickness dimension for establishing a magnetic field along at least one exposed surface thereof between said end faces which magnetic field is generally parallel to said axis,

a closed loop of magnetic fluid along said at least one exposed surface maintained thereat by said magnetic field thereat,

one of said end faces being a north magnetic pole and the other being a south magnetic pole,

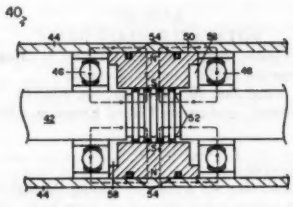
and means for fastening said first and second thin permanent magnet means together along said axis with adjacent contacting end faces being of the same polarity.

4,526,382

RADIALLY POLARIZED MULTIPLE-STAGE FERROFLUID SEAL APPARATUS

Kuldip Raj, Merrimack, and Hanumaiah L. Gowda, Nashua, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed May 3, 1984, Ser. No. 606,586
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—80 **12 Claims**



1. A radially polarized, multiple-stage ferrofluid seal apparatus which comprises:

(a) a magnetically permeable housing;

(b) a magnetically permeable shaft element to be sealed and extending within the housing;

(c) a magnetically permeable bearing means to support the shaft element;

(d) a radially polarized permanent magnet means to provide a source of magnetic flux and having a one and another end, one polarized end extending into a close, noncontacting relationship with the surface of the shaft element to form a plurality of radial gaps between the polarized end and the surface of the shaft element;

(e) ferrofluid retained in the radial gaps to form a plurality of O-ring ferrofluid seals about the surface of the shaft element; and

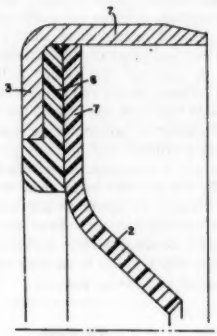
(f) the bearing means and the other end of the radially polarized magnet in a magnetic flux relationship to provide a magnetic flux circuit between the permanent magnet means, the housing, the bearing means, the shaft, and the ferrofluid in the radial gaps.

4,526,383

LIP SEAL CONNECTED TO STIFFENING RING BY RUBBER-ELASTIC LAYER

Dieter Fuchs, Asternweg 8, 6086 Riedstadt-Crumstadt, and Hans Ruhland, Ziegelhuettenstrasse 5, 6101 Reichelsheim, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 537,045, Sep. 29, 1983, abandoned. This application Feb. 13, 1984, Ser. No. 579,730
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309538
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—152 **6 Claims**



1. A sealing device for rotating and for reciprocating machine parts, comprising

a stiffening ring of angular profile having an inwardly directed carrying web,

a lipring of non-elastomeric plastic material, said lipring having

a freely inwardly extending lip section axially deflected in the direction of the sealed medium, and

an outer, holding section, and

a rubber-elastic, liquid- and gas-tight intermediate layer, the holding section of said lipring being fixed relatively to the carrying web of the profile of said lipring by means of said intermediate layer,

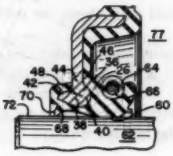
wherein said carrying web and said intermediate layer are connected together as one piece, and

wherein said layer has a thickness of at least 0.5 mm and a Shore A hardness of 65 to 85 and the ratio of the extent of the intermediate layer in radial direction to the thickness of said layer is 3 to 7.

4,526,384
SEAL HAVING CASING UNIT WITH CONTOURED ANNULAR INNER DIAMETER

William M. Riley, Jr, Gurnee, and Gregory R. Vassmer, Elgin, both of Ill., assignors to Chicago Rawhide Mfg. Co., Elgin, Ill.

Filed Nov. 25, 1983, Ser. No. 554,893
Int. Cl.[3] F16J 15/32
U.S. Cl. 277—153 11 Claims

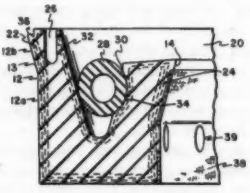


1. An improved high pressure seal unit comprising, in combination, a casing portion and a sealing lip portion, said casing portion including at least one flange part adapted to be positioned adjacent a part of an associated sealed mechanism to locate said seal in an installed position of use; a generally radially extending flange joined to said first flange part and adapted to extend across and close off a portion of an opening defining a portion of a sealed region in which fluid may be confined under pressure, said radially extending flange also including one inner marginal surface directed toward said sealed region, and radially innermost mounting bead portion, said bead portion being contoured so as to have an enlarged cross-section with respect to the cross-section of the remaining portion of said casing portion and including a continuous smoothly curvilinear annular bonding surface which includes a first surface portion directed generally toward the fluid side of the seal, a second intermediate surface joined to said first surface and directed generally toward the inner diameter opening defined by said seal, and a third surface portion joined to said second surface portion and being directed at least partially away from said fluid side and toward the exterior of said sealed region, said sealing lip portion being made from an elastomer and including a primary seal lip body portion having first and second generally frusto-conical surfaces facing respectively at least partially toward and away from said sealed region and meeting to define a circumferentially extending primary seal band area of intended contact with an associated sealed shaft or like part, and a bonding portion completely surrounding and being permanently bonded to at least said first, second, and third surfaces of said casing portion.

4,526,385
SELF-LUBRICATING PACKING MEMBER

John H. Wheeler, Dallas, Tex., assignor to Texacone Company, Mesquite, Tex.

Filed Nov. 13, 1984, Ser. No. 670,221
Int. Cl.[3] F16J 15/32, 15/40
U.S. Cl. 277—153 15 Claims



1. A self-lubricating packing member comprising: an annular body having a circular outer wall and a circular inner wall, with first and second end walls extending between the inner and outer walls;

said annular body having a groove with inner and outer groove walls extending axially into the body through the first end wall;

the inner and outer walls of said body including inner and outer sealing lips, respectively, formed therein adjacent to at least a portion of the groove;

a resilient, circular member comprising an elastomeric O-ring member engaging both of the groove walls for applying a radially directed force to both of the sealing lips;

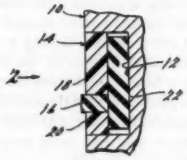
said annular body including a plurality of spaced apart openings extending axially into the first end wall thereof between the other groove wall and the other sealing lip, and

a layer of self-lubricating polymeric material adhered to the circular inner wall to provide lesser frictional force when in slidable contact with a separate movable part.

4,526,386
NESTED SERPENTINE SEAL ASSEMBLY

James A. Repella, Berkley, Mich., assignor to Microdot Inc., Darien, Conn.

Filed Apr. 23, 1984, Ser. No. 603,147
Int. Cl.[3] F16J 15/18
U.S. Cl. 277—188 R 3 Claims



1. A seal assembly for a grooved circular piston or the like comprising an annular seal element of relatively hard inelastic material, said seal element having undulating axially facing parallel edge portions to facilitate circumferential expansion thereof for assembly in said piston, said seal element having right circular cylindrical radially inner and outer faces for acceptance in said piston groove, a pair of support elements having axially facing undulating edge portions complementary to the undulations of said seal element for assembly therewith in nesting relationship, said support elements having straight edge portions engageable with juxtaposed edges of the groove in said piston, said support elements being disposed on opposite sides of said seal element to stabilize said seal element against axial distortion in said piston groove, and a resilient expander ring disposed radially inwardly of said seal element and support elements.

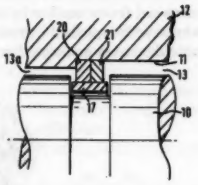
4,526,387
ROTATABLE SHAFT SEALS

Ralph F. J. Flower, Bath, England, assignor to Cross Manufacturing Company (1938) Limited, England

Filed Jan. 20, 1984, Ser. No. 572,516
Claims priority, application United Kingdom, Jan. 28, 1983, 8302450
Int. Cl.[3] F16J 9/00
U.S. Cl. 277—198 6 Claims

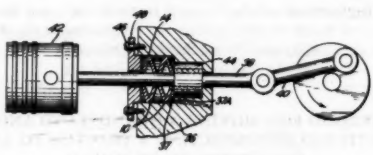
1. A seal assembly for a shaft extending through a bore in a housing and adapted for rotation at very high rates, which sealing assembly comprises an annular groove formed around a part of the shaft which lies within the bore in the housing, a first resilient split-ring sealing member located within said groove and tending to spring outwardly free of the groove, and at least one second resilient split-ring sealing member of lesser ovall axial width than the first sealing member, the second sealing member being located partially within said

groove so as to overlie and be engaged by said first split-ring sealing member, the at least one second split-ring sealing member also tending to spring outwardly and bearing against a wall of said bore defined by the housing with a sufficient force to restrain rotation of said at least one second sealing member so as to thereby to effect a seal against said housing, the rotation



of said first sealing member being restrained by virtue of the engagement thereof with the at least one second sealing member, said first sealing member being free to slide axially with respect to said at least one second sealing member thereby to be able to follow minor axial shaft movements whilst still effecting a seal therewith.

4,526,388
ONE-PIECE SEALING RING FOR A SHAFT
Charles R. Marshall, Warwick, R.I., assignor to Dixon Industries Corporation, Bristol, R.I.
Filed May 17, 1984, Ser. No. 611,122
Int. Cl.³ F16J *15/08*
U.S. Cl. 277—206 **10 Claims**



1. A one-piece, self-lubricating thermoplastic sealing ring for a reciprocating or rotating shaft, the sealing ring having an inner diameter which is sized to be mounted on and contact the outer diameter of said shaft to provide a seal therebetween;

said ring having a circumferential planar wall with first and second edges;

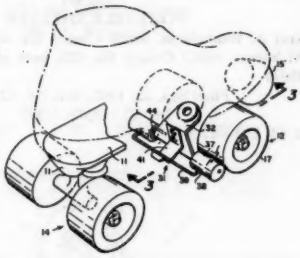
said ring having first and second radial planar walls, the outer edges of said first and second radial walls intersecting, respectively, said first and second edges of said circumferential wall, said first and second radial walls being cut to form a beveled joint at their respective intersections with said edges of said circumferential wall;

each of said first and second radial walls having a radial cut extending therethrough, said radial cuts in each of said first and second radial walls also extending through said first and second edges, respectively, and through a portion of said circumferential wall having a transverse cut therethrough along its circumference, the opposite ends of said transverse cut intersecting the radial cuts in said first and second radial walls, the first and second radial walls and said circumferential wall defining an annular shaped cavity within said ring, said radial cuts and said transverse cut enabling said ring to be twisted open and mounted on or removed from around said shaft;

said radial cuts in said first and second radial walls and said annular cavity defining a leak path through the sealing ring which requires fluid leaking into one of said radial cuts to fill said annular cavity before leaking out of the other radial cut;

said radial walls flexing upon application of sufficient pressure thereto at an angle parallel to the longitudinal axis of the shaft and upon application of sufficient pressure to said circumferential wall at right angles to the longitudinal axis of the shaft so that said inner diameter is urged radially inwardly.

4,526,389
ROLLER SKATE BRAKE
J. Burrell Chase, Rte. #1, Box 335, Arcata, Calif. 95521
Filed Feb. 27, 1984, Ser. No. 583,843
Int. Cl.³ A63C *17/14*
U.S. Cl. 280—11.21 **2 Claims**



1. A brake for a roller skate with a shoe having fixed thereto a truck assembly supporting an axle on which is mounted two parallel positioned wheels capable of rotating in the forward and reverse directions and the axle is supported to turn when the shoe is tilted relative to the truck assembly wheels, said brake comprising:

a shaft;

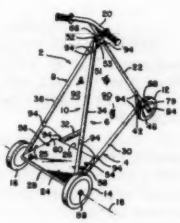
a roller eccentrically mounted on each end of said shaft to include radial sections having large and small radii;

means mounting said shaft on said skate with each of said rollers having a small radius section abutting one of said wheels peripheries and positioned to be rotated to bring a large radius section into contact with its respective wheel when the wheels are rotated in the reverse direction to thereby increase the contact pressure between each wheel and its respective roller;

said means mounting said shaft including a bracket fixed to tilt and turn the roller with the axle so as to maintain equal roller pressure on the wheels of the truck assembly; and

means stopping rotation of said roller so the roller will brake rotation of the wheel when the wheel is rotated in the reverse direction.

4,526,390
TOY VEHICLE
Arthur M. Skolnik, 612 - 36th Ave., Seattle, Wash. 98122
Filed Mar. 21, 1983, Ser. No. 477,355
Int. Cl.³ B62D *7/00*
U.S. Cl. 280—87.04 R **12 Claims**



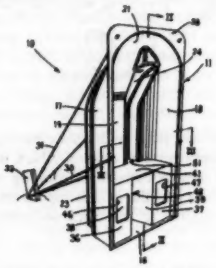
1. A toy vehicle, comprising: a body supporting a front

wheel and two rear wheels arranged in a triangular wheelbase; steering means rotatably connected to said front wheel and operative from a position displaced substantially above said rear wheels for turning said front wheel; and support means rigidly mounted to said body and to said steering means; and support surface connected to said body and arranged with respect to said steering means and said two rear wheels that the vehicle may be tilted onto any two of its three wheels at a time and then may be balanced in that position by controlling the application of weight to said support surface and applying a balancing force to said steering means.

4,526,391
PORTABLE SHELTER

Robert A. Winkelman, 46550 County Rd. 653, and Roland E. Nicholson, 46917 County Rd. 653, both of Paw Paw, Mich. 49079

Filed Sep. 23, 1982, Ser. No. 422,418
Int. Cl.³ E04B *1/347*
U.S. Cl. 280—12 S **12 Claims**



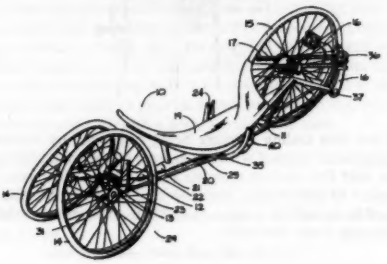
1. A portable shelter, comprising a shell having spaced, upstanding side walls, an upstanding rear wall extending between the rear edges of said side walls, and a top wall extending between the upper edges of said side and rear walls, means for supporting said shell in an upright operational position, means defining a seat between said side walls and means defining a sliding surface on the outer side of said rear wall for slidably supporting said shelter on ice and snow to facilitate transport thereof; wherein said means for supporting said shell in an upright position includes said shell having a bottom wall, said side and rear walls extending upwardly from the peripheral edges of said bottom wall; wherein said seat is spaced above said bottom wall, and including wall means defining at least one compartment in the region between said side walls, seat and bottom wall; wherein said wall means defines first and second spaced and substantially closed compartments located adjacent respective said side walls, said wall means having means defining at least two openings therein for providing access to said first and second compartments, respectively; and wherein the space between said first and second compartments serves as a third, substantially open compartment.

4,526,392
RECUMBENT VELOCIPEDE

David E. Berkstresser, 2119 W. 235 St., Torrance, Calif. 90501

Filed Nov. 15, 1982, Ser. No. 441,934
Int. Cl.³ B62K *5/04, 17/00*
U.S. Cl. 280—281 LP **7 Claims**

1. A wheeled vehicle comprised of:
a frame assembly consisting of an elongated forward frame section and a relatively smaller rearward frame section;
a single ground engaging front wheel associated with the forward frame section;
a pair of transverse symmetrically opposed ground engaging rear wheels associated with the rearward frame section;
the forward frame section linked with the rearward frame section in such a manner that the forward frame section and the rearward frame section can have a relative rotational displacement on a substantially longitudinal axis;
the single front wheel located near the front of the forward frame section and constrained to rotate on an axle fixed in the transverse direction to the forward frame section;
the rear wheels constrained to rotate on individual stub axles linked to the rearward frame section by pivotal members;
steering of rear wheels accomplished by rotating said pivotal members on individual axes associated with the rearward



frame section by appropriate linkage means, maintaining a specific relation between the rear wheels and the ground surface;
a control linkage to control (a) the relative rotational displacement between the rearward frame section and the pivotal members around their individual axes for controlling rear wheel steer angle, and (b) the relative rotational displacement of the forward frame section and the rearward frame section around the longitudinal axis, without functions (a) and (b) mechanically linked.

4,526,393
METHOD FOR MOVING A GRANDSTAND AND A HITCH FOR CONNECTING A TRACTOR TO AN IMPLEMENT TO BE TOWED.

L. G. Smith, 7710 Morris Rd., Hilliard, Ohio 43026

Filed May 24, 1983, Ser. No. 497,429
Int. Cl.³ B60D *1/00*
U.S. Cl. 280—406 R **6 Claims**

1. A method of moving a grandstand, said grandstand including a plurality of end standards for engaging a grandstand supporting surface, the method comprising,
mounting cylindrical support means on said grandstand intermediate the end standards with the axis of said cylindrical support means being (1) substantially horizontal with respect to the surface supporting the grandstand and (2) perpendicular to the intended direction of movement of the grandstand,
mounting a connection point on one end standard of said grandstand,
connecting a hitch to said connection point with said hitch and point being configured to allow relative rotation about an axis substantially parallel to said axis of said cylindrical support means,
lifting the hitch, connection point and the one end of the grandstand while the end standard on the other end of the grandstand remains in contact with the support surface.

then mounting a pair of wheels on and coaxial with said cylindrical support means, the wheels having a radius greater than the distance from the axis of the cylindrical support means to a plane coextensive with the lowermost points of the end standards,

lowering the hitch until the wheels engage the supporting surface and the end standards are all out of contact with the supporting surface,

pulling the grandstand to a different location.

3. A hitch for connecting a tractor to an implement to be towed comprising,

a pair of spaced apart load bars, each bar being connected to the tractor and said bars being joined together at their distal ends by a cross-bar,

a pair of tie bars joined together at one end and spaced apart at the other end,

means connecting the joined ends of the tie bars to the cross-bar for relative universal pivoting through angles of greater than 45° in both the vertical and horizontal planes,

the spaced apart ends of the tie bars each including a means for connecting to an implement,

a hoist bar extending vertically upward from a rigid attachment to both tie bars,

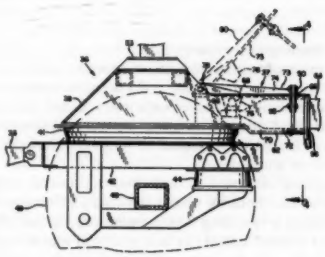
a chain attached between the upper portion of the hoist bar and a power means for pulling the chain to thereby rotate the tie bars vertically about an axis through the connecting means between the cross-bar and the tie bars.

4,526,394

APPARATUS FOR CONVERTING A TRAILER HAVING A CANTILEVERED REACH INTO A TRAILER HAVING A REACH EXTENDING BETWEEN SPACED-APART SETS OF WHEELS

Gene C. Whitaker, Wilbur, Oreg., assignor to Whitlog, Inc., Wilbur, Oreg.

Filed Mar. 7, 1983, Ser. No. 473,029
Int. Cl.³ B60D *1/00*; B62D *53/00*
U.S. Cl. 280—404 **10 Claims**



1. A dolly for converting a trailer having an elongate cantilevered reach into a trailer having a reach which extends between spaced-apart sets of wheels, said dolly comprising:

(a) a chassis;

(b) at least one pair of wheels rotatably mounted about a transverse axle;

(c) steering means for rotating said wheels relative to said chassis about an axis substantially perpendicular to said axle;

(d) housing means for receiving at least a portion of said elongate reach and for retaining it tightly with respect to said housing means;

(e) cover means associated with said housing means;

(f) means for movably mounting said cover means on said housing means for movement between an open position which permits placement of said portion into said housing and a closed position which retains said portion in said housing means; and

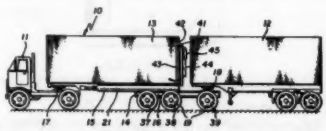
(g) locking means for locking said cover means in said closed position.

4,526,395

TANDEM TRAILER SYSTEM

Gerard Arguin, 3 Valley St., Spencer, Mass. 01562

Division of Ser. No. 294,775, Aug. 20, 1981, Pat. No. 4,400,004.
This application Aug. 8, 1983, Ser. No. 520,993
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.³ B62D *53/08*
U.S. Cl. 280—408 **5 Claims**



1. Trailer system to be drawn behind a highway tractor and behind which can be drawn a second trailer unit, comprising:

(a) a cargo container,

(b) a chassis on which the container is mounted, the chassis having a first upper portion and a second lower portion, the second portion being longitudinally slidable relative to the first portion from a first position generally co-extensive with the first portion to a second position where it extends beyond the end of the cargo container, the first portion of the chassis consisting of a pair of I-beams held in spaced, parallel relationship for attachment to the container, the second portion of the chassis consisting of a similar pair of I-beams connected together in spaced, parallel relationship and underlying the first portion, so that the undersurface of the lower flange of each I-beam of the first portion is supported on upper surface of the upper flange of the corresponding I-beam of the second portion, a plurality of guides being fixed to the I-beams of the second portion and embracing the lower flanges of the I-beams of the first portion,

(c) a pair of locking pins mounted on the second portion for transverse movement to engage apertures in the first portion when the second portion is in the first or second position to hold the first and second portions against relative sliding movement when in the first or second position,

(d) first attaching means associated with the front end of the container for connection to the highway tractor,

(e) a second attaching means associated with the second portion of the chassis, so that, when the second portion is in the second position, another trailer can be attached to it,

(f) wheels mounted on the said second portion of the chassis, the wheels being provided with pneumatic brakes, the locking pins being provided with a pneumatic actuator cylinder, and a selector valve being provided to connect a source of pressure air selectively to the brakes or the cylinder, so that the locking pins are released when the brakes are locked and the pins are engaged when the brakes are free, and

(g) electrical and pneumatic cables extending through the upper portion and attached to a wand extending upwardly from the lower portion, the lower end of the wand being attached to the lower portion through a spring, so that the cables and wand can be bent downwardly when the lower portion is moved from the second position to the first position.

4,526,396

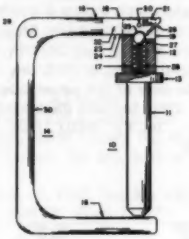
LOCKABLE HITCH PIN

Robert Mayer, Rte. 1, Box 80, Plainview, Minn. 55964

Filed Jun. 1, 1983, Ser. No. 500,190

Int. Cl.³ B60D 1/02

U.S. Cl. 280—515 3 Claims



1. A hitch pin comprising:

A. A shaft portion;

B. A head portion having a shoulder projecting outwardly of said shaft portion, said head portion having defined therein a longitudinally extending bore;

C. A generally "C" shaped arm being pivotally attached to said head portion and having a pivotal end, a central portion, and a distal end, said arm being rotatable from a closed position wherein said distal end is positioned beneath the end of said shaft portion oppositely of said head portion, and an opened position wherein said distal end has been swung away from the bottom end of such shaft portion; said pivotal end of said arm defining a cam surface comprising a first, curved portion and a second, upwardly extending second portion immediately adjacent said first, curved portion;

D. A compression spring located within the bore defined in said head portion; and

E. A spherical cam follower positioned within said bore between said spring and said cam surface such that said spring acts to bias said cam follower against said cam surface.

4,526,397

ELECTRONIC SAFETY SKI BINDING HAVING OBLIQUE, ORTHOGONAL TRANSDUCERS

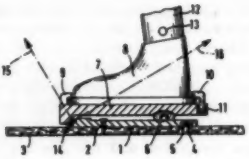
Manfred Richert, Munich, Fed. Rep. of Germany, assignor to Marker International Company, Salt Lake City, Utah

Filed Sep. 30, 1982, Ser. No. 431,230

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3140218

Int. Cl.³ A63C 9/08

U.S. Cl. 280—612 17 Claims



1. An electronic ski binding for electrically detecting the forces exerted on a skier's leg inserted in a ski boot latched in the binding, for generating electrical signals in response to the detected forces and for releasing a latched ski boot from the binding when the electrical signals exceed a predetermined threshold value, said binding comprising:

first base plate means for attaching the binding to a ski;

sole plate means for receiving the sole of a ski boot including a generally planar sole receiving surface;

interconnection means for movably interconnecting said first base plate means and said sole plate means;

orthogonal transducing means having first and second pressure axes;

mounting means associated with said sole plate means for mounting said transducer means to orient said first and second pressure axes perpendicular to each other and at an oblique angle which is substantially displaced from said sole plate means to cause said transducing means to generate electrical signals in the direction of said respective first and second pressure axes in response to the components of forces applied to said transducing means in said directions; and latch means mounted on said sole plate for securing said ski boot to said sole plate, said latch means being responsive to said electrical signals for releasing said ski boot.

4,526,398

TOURING SKI BINDING

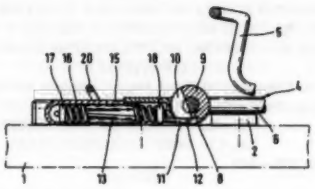
Gerhard Sedlmair, Farchant, Fed. Rep. of Germany, assignor to Marker International, Salt Lake City, Utah

Filed Feb. 9, 1983, Ser. No. 465,112

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204650

Int. Cl.³ A63C 9/08

U.S. Cl. 280—615 16 Claims



1. A ski binding comprising:

housing means for mounting the binding to a ski;

platform means for receiving a ski boot, including a transverse axle having an axis of rotation, said axle being pivotally attached to said housing means for pivoting said platform means with respect to said ski about the axis of rotation of said axle;

biasing means disposed in said housing means, and connected to said housing means and said platform means for establishing a restoring bias moment urging said platform to pivot toward said ski as said platform means is pivoted away from said ski; and

connection means fixed to said axle for connecting said biasing means to said platform means at a location offset from a plane, but approaching the plane as said platform is pivoted away from said ski, said plane being generally parallel to said ski and containing the acis of rotation of said axle, for reducing the force required to rotate said platform means as said platform means is displaced from the ski and keeping the restoring bias moment substantially constant during such displacement.

4,526,399

CART SUPPORT FOR A COMPUTER PRINTOUT

Gilbert J. Holtz, 182 Tibbetts Rd., Yonkers, N.Y. 10705

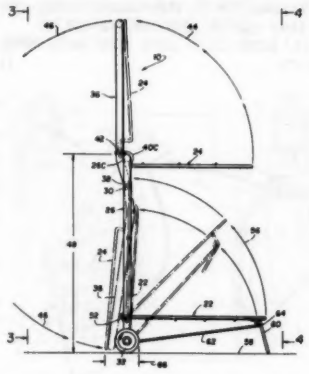
Filed Jan. 3, 1984, Ser. No. 567,698

Int. Cl.³ B62B 1/26

U.S. Cl. 280—655 2 Claims

1. A movable cart serving as a support for a computer printout in the production of which a supply length of blank paper is fed into a computerized printing station and is subsequently

received therefrom as printed paper providing said computer printout, said cart comprising a first lower inverted U-shaped frame having a pair of downwardly extending legs interconnected by a horizontally oriented leg and a lower axles and on upper axle connected in spanning relation between said downardly extending legs, a pair of wheels journelled on said lower axle to provide mobility to said cart, a lower first shelf pivotally connected adjacent the lower end of said first frame and being pivotally movable from a storage position adjacent said first frame into an operative position extending laterally therefrom incident to having supported thereon said supply length of blank paper preparatory to the feeding thereof into said computerized printing station, a second upper inverted U-shaped frame pivotally connected to said upper axle so as to be pivotally movable from a storage position adjacent said first frame into an operative position forming an extension thereof,



and an upper second shelf pivotally connected adjacent the lower end of said second frame and being pivotally movable from a storage position adjacent said second U-shaped frame into an operative position extending laterally therefrom incident to having supported thereon said imprinted paper length exiting from said printing station as a computer printout, said second shelf having gripping means thereon consisting of curved length segments on opposite sides of said second shelf provided at selected locations therealong which are adapted to engage in a snap fit the horizontally oriented leg of said first frame in said laterally extending operative position thereof, whereby said snap fit engagement holds said first and second frames in extended relation to each other and also holds said second shelf in its laterally extended operative position, such that said cart provides two shelves for separately supporting said blank and imprinted paper.

4,526,400

VEHICLE REAR SUSPENSION MECHANISM

Takao Kijima, and Jiro Maebayashi, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

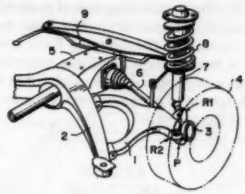
Filed Apr. 27, 1983, Ser. No. 489,106

Claims priority, application Japan, Apr. 28, 1982, 57-71936; Apr. 28, 1982, 57-71937

Int. Cl.³ B60G *3/26, 7/00*

U.S. Cl. 280—701 **11 Claims**

1. A vehicle rear suspension mechanism comprising a suspension member connected with a vehicle body, wheel hub means supporting a rear wheel having a wheel center plane for rotation about a rotating axis, connecting means for connecting said wheel hub means with said suspension member, said connecting means including ball joint means having a pivot center and connecting said wheel hub to said suspension member pivotably about the pivot center, first resilient means located between said wheel hub means and said suspension member in one of quadrants defined in a rectangular coordinate having an origin on said rotatable axis of said rear wheel other than the quadrant wherein the ball joint means is located, second resilient means located between said wheel hub means and said



suspension member in one of the quadrants other than the quadrants wherein said ball joint means and said first resilient means are located.

4,526,401

ELECTRONIC CONTROL SYSTEM FOR ADJUSTABLE SHOCK ABSORBERS

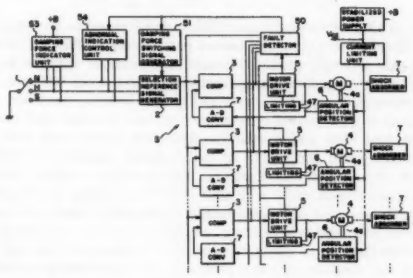
Shinobu Kakizaki, and Yoshifumi Yamamoto, both of Kanagawa, Japan, assignors to Atsugi Motor Parts Co., Ltd., Atsugi, Japan

Filed Nov. 28, 1983, Ser. No. 555,610

Claims priority, application Japan, Nov. 30, 1982, 57-210278; Dec. 15, 1982, 57-219933; Jan. 25, 1983, 58-10286

Int. Cl.³ F16F *9/44;* **B60G** *9/00*

U.S. Cl. 280—707 **27 Claims**



1. A control system for adjustable shock absorbers, each comprising a damping-force adjusting means, comprising:

(a) a switch for selecting a desired one of a plurality of damping-force states;

(b) a selection reference signal generator responsive to the selection of the desired state for producing a corresponding damping-force selection reference signal;

(c) drive means for driving the damping-force adjusting means of said shock absorber to a desired position at which the desired damping-force is produced by the shock absorber in accordance with the reference signal;

(d) means for sensing the position of the damping-force adjusting means and producing a detection signal indicative of the position of the damping-force adjusting means;

(e) said drive means including a comparator for comparing the reference signal with the detection signal and generating a non-coincidence signal when the reference signal does not coincide with the detection signal, thereby driving the damping-force adjusting means until the reference signal and the detection signal coincide, and generating a coincidence signal when the reference signal and the detection signal coincide, thereby stopping the driving of said damping-force adjusting means;

(f) a fault detector for ouputting an abnormality signal indicative of abnormal adjustment of at least one of said shock

absorbers when a time interval from the beginning to the end of the damping-force adjustment process by said damping-force adjusting means exceeds a predetermined value; and

(g) a damping-force switching signal generator responsive to the abnormality signal from said fault detector for compulsively switching the damping-force selection reference signal to a normal-damping-force selection reference signal, thereby driving said damping-force adjusting means to a predetermined position in response to abnormal shock absorber adjustment.

4,526,402

SKI GUARD

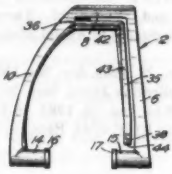
Günter Schwarz, Alte Steinacherstr. 15, CH-8804 Au ZH, Switzerland

Filed Nov. 4, 1982, Ser. No. 439,230

Claims priority, application Switzerland, Jan. 21, 1982, 386/82

Int. Cl.³ A63C *11/00*

U.S. Cl. 280—817 **19 Claims**



1. A tiltable ski guard comprising a base member arranged to be attached to a ski and a swivel part having at least one bearing axle pivotally mounted in said base member with the bearing axle arranged to extend transversely to the ski, wherein the improvement comprises an elongated holding member attached to said swivel part at least at one location and being separated from and extending along said swivel part over at least a part of the length of said holding member extending from the attachment location, said holding member being pivotally displaceable with said swivel part about the bearing axle thereof and being elastically deformable relative to said swivel part, and said holding member has at least one support surface thereon in contact with said base member and said at least one support surface is positioned on said holding member at a location spaced remotely on said holding member from the attachment location of said holding member to said swivel part where said holding member is separate from said swivel part.

4,526,403

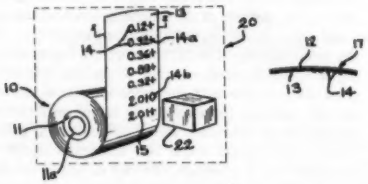
COMBINED CALCULATOR TAPE AND COUPON AND METHOD OF USE

Robert W. Park, 1007 Forest La., Mt. Pleasant, Mich. 48858

Continuation of Ser. No. 390,216, Jun. 21, 1982, abandoned. This application Aug. 20, 1984, Ser. No. 642,115

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—62 **2 Claims**



2. A method of providing individual and total mometary amounts on a tape and redemption coupons together using a calculator with a printer for the amounts and with a roll of tape fed to the printer which comprises:

(a) providing a roll of tape in the calculator wherein the tape is provided with a dried, moisture sensitive printable adhesive on one side which is towards the printer and wherein the other side of the tape is provided with printed matter in the form of redemption coupons;

(b) dispensing and printing on the adhesive side of the roll the individual and total monetary amounts using the printer; and

(c) removing a segment of the roll from the calculator, said segment including at least a portion thereof which is printed on the adhesive side of the tape.

4,526,404

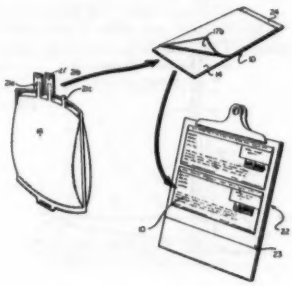
CONTAINER FOR CLINICAL PRODUCT

Richard M. Vazquez, 716 W. Hutchinson, Chicago, Ill. 60613

Filed Apr. 29, 1983, Ser. No. 489,715

Int. Cl.³ B42D *15/00*; G09F *3/00*; B65D *79/00*

U.S. Cl. 283—79 **11 Claims**



1. In a container for dispensing a medicinal product, said container having (i) a product access port, and (ii) a first label having a front surface for identifying the container's contents and a rear surface, the improvement comprising:

means for removeably mounting said first label across said product access port such that access to said port is blocked by said label; and

an adhesive material on said rear surface of the first label for posting said label in a patient record.

4,526,405

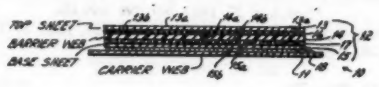
LABEL STRUCTURE

James C. Hattemer, Cincinnati, Ohio, assignor to Graphic Resources, Inc., Cincinnati, Ohio

Filed Dec. 17, 1982, Ser. No. 450,538

Int. Cl.³ B32B *7/06*

U.S. Cl. 283—81 **15 Claims**



1. A label supply in elongated form and comprising:

an elongated carrier web of predetermined width and indeterminate length;

a plurality of separate base sheets on said web, an upper side of said base sheet being printed with ink;

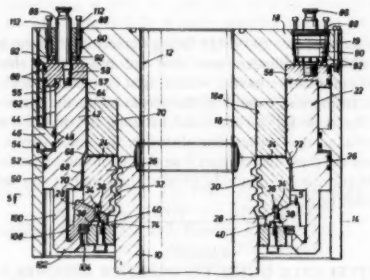
a plurality of top sheets, respective ones of said top sheets being disposed over respective base sheets, said top sheets being printed with ink on at least an underside thereof;

a plurality of barrier sheets, respective ones of said barrier sheets disposed between respective top and base sheets;
first adhesive layers securing respective barrier sheets to upper sides of their respective base sheets;
second adhesive layers removably securing respective barrier sheets to the undersides of their respective top sheets so said respective top sheets can be removed therefrom;
said barrier sheets preventing ink transfer between said top sheets and said base sheets; and
said barrier sheets remaining with said base sheets when said top sheets are removed therefrom.

4,526,406
WELLHEAD CONNECTOR

Norman A. Nelson, 6902 Wagon Wheel La., Houston, Tex. 77088

Continuation-in-part of Ser. No. 284,010, Jul. 16, 1981, abandoned. This application Sep. 14, 1981, Ser. No. 301,530
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—18 18 Claims



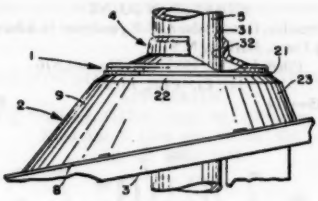
1. Connector apparatus for connection to a wellhead in generally coaxial alignment therewith, comprising:
a generally tubular main body;
latch means carried by said main body for generally radial extension and retraction with respect thereto;
support means carried by said main body longitudinally adjacent said latch means for generally radial extension and retraction with respect thereto at least partially independently of said latch means, said support means and said main body having a set of opposed slide surfaces which undergo generally radial relative movement during such extension and retraction of said support means, said support means and said latch means having a set of opposed, abutting support surfaces, at least one of said sets of opposed surfaces being inclined with respect to the path of movement of said support means for wedging said latch means longitudinally as said support means is so radially extended; and
actuator means on said main body and operatively associated with said latch means and said support means to successively extend said latch means and said support means.

4,526,407
ROOF FLASHING

David E. Kifer, Parma, Ohio, assignor to Oatey Co., Cleveland, Ohio

Filed Apr. 27, 1981, Ser. No. 257,936
Int. Cl.³ E04B *5/48*
U.S. Cl. 285—42 17 Claims

1. A roof flashing comprising a base member adapted to be secured to a roof, and a collar for establishing a weather-proof seal with an upstanding pipe passing through an opening in such roof, both said base member and collar being made of an elastomeric material, said base member having an opening therein surrounded by a stepped flange, said stepped flange including a radially inwardly extending annular lip portion having a plurality of circumferentially spaced slots therein, and an external cylindrical surface extending axially inwardly from the radial outer edge of said annular lip portion, the material of said collar extending through said slots and wrapping around said annular lip portion to form a series of closed loops providing a positive mechanical lock between said collar and base

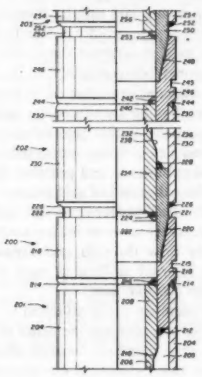


member, said collar also extending around said external cylindrical surface, said external cylindrical surface having an axial length greater than the wall thickness of said collar in the region of said external cylindrical surface, said collar extending substantially the full length of said external cylindrical surface in sealing engagement therewith to aid in the formation of a fluid-tight joint between said collar and base member.

4,526,408
INSULATING TUBULAR CONDUIT

David M. Anderson, Whittier, Calif., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Jul. 19, 1982, Ser. No. 399,563
Int. Cl.³ F16L *59/14*
U.S. Cl. 285—47 6 Claims



1. A concentric walled insulating tubular conduit for use in a tubular string to transport fluids in a subterranean oil well comprising:
concentric inner and outer tubular members of substantially the same length;
enlarged upset portions on the inner tubular member, formed by forging the ends of a tubular member of initially constant thickness to form upset ends of greater thickness than the intermediate portions thereof;
an annular coupling bushing sealingly secured to each end of said concentric inner and outer tubular members, said annular coupling bushing having a spacer portion disposed radially between the upset portion of the inner tubular member and the inner wall portion of the outer tubular member to isolate the space between said inner and outer tubular members;

said spacer portion being adhesively bonded at elevated temperatures to both said inner tubular member and said outer tubular member while said inner tubular member is prestressed in tension.

4,526,409

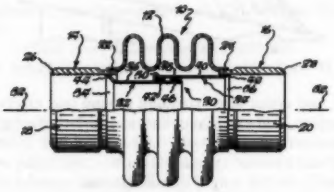
EXPANSION JOINT

David A. Schaefer, Grand Island, N.Y., assignor to Adsco Manufacturing Corp., Buffalo, N.Y.

Filed Jan. 27, 1983, Ser. No. 461,576

Int. Cl.³ F16L *13/04*

U.S. Cl. 285—114 **5 Claims**



1. An expansion joint for connection between spaced apart and aligning ends of two pipes, said expansion joint comprising:

two end portions oriented in spaced relationship and in axial alignment with one another and connectable between two spaced and aligning pipe ends;

a corrugated tubular member defining a series of circumferential corrugations along its length and defining two opposite ends which are each fixedly attached to a corresponding end portion of said joint;

a first sleeve having two opposite ends and being positioned substantially within said tubular member, one end of said first sleeve being supportedly connected to one of said end portions for axial movement therewith;

a first stop member being attached to the inner wall of said first sleeve adjacent the other of its ends;

a second sleeve having two opposite ends and being positioned substantially within said tubular member, one end of said second sleeve being supportedly connected to the other of said cylindrical end portions for axial movement therewith, the other end of said second sleeve being positioned within the first sleeve so that said first and second sleeves collectively serve to reduce turbulence induced by high velocity flow through said expansion joint and to protect the internal surface of said corrugated tubular member from erosion; and

a second stop member being attached to the outer wall of said second sleeve adjacent the other of its ends, said first and second stop members located substantially midway between said two cylindrical end portions and cooperating with one another to limit the axial extension of said joint.

4,526,410

PLASTIC CONNECTOR FOR HOSES

Christoph Vohrer, Hattsteiner Str. 22, d-6240 Konigstein 2, Fed. Rep. of Germany

PCT No. PCT/DE82/00056, § 371 Date Nov. 16, 1982, § 102(e) Date Nov. 16, 1982

PCT Filed Mar. 15, 1982, Ser. No. 444,898

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110494

Int. Cl.³ F16L *39/02*

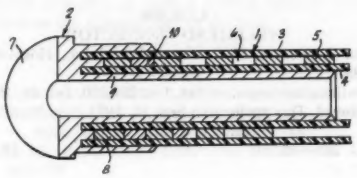
U.S. Cl. 285—149 **9 Claims**

1. A connector for an end of a hose (1) having outer (3) and inner (4) flexible tubes of elastomeric or thermoplastic material and a helical reinforcement (5) between and fastened to the tubes and cooperating therewith to define a helical cavity (6), said connector comprising:

a. an outer sleeve (8) encircling and fitting closely against the outer flexible tube adjacent said hose end and bonded thereto;

b. an end fitting (7) integrally joined to the outer sleeve and abutting the ends of the tubes;

c. a helical projection (13) integrally extending from said fitting into said helical cavity through a plurality of turns thereof; and



d. an inner sleeve (9 or 11) fitting closely within the inner flexible tube adjacent said hose end and bonded thereto, said inner sleeve having a fluid-tight connection with said end fitting and extending therefrom along the inner wall of the hose for a substantial distance beyond the outer sleeve, so that within that distance, the inner sleeve supports the hose and stiffens it so that its minimum radius of curvature is substantially greater than that of the unsupported hose.

4,526,411

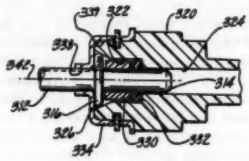
SWIVELABLE QUICK CONNECTOR ASSEMBLY

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Continuation-in-part of Ser. No. 201,711, Oct. 29, 1980, Pat. No. 4,423,892. This application Dec. 12, 1983, Ser. No. 560,746

Int. Cl.³ F16L *37/12*

U.S. Cl. 285—305 **1 Claim**



1. A connector assembly for providing a quick connection, comprising:

a tubular conduit adapted to convey fluid, having outwardly projecting annular surface means, formed at a predetermined distance from an end of said conduit to be connected, for providing a blocking wall portion disposed transversely to a central axis of said conduit, said end of said conduit to be connected being radially inwardly beveled;

a cylindrical housing having variable diameter axial bore means formed therein for receiving said conduit at a first end and for providing a fluid path therethrough, said bore means providing a first diameter portion at said first end and a second diameter portion at second end, the magnitude of said first diameter being greater than the magnitude of said second diameter, said first diameter portion of said housing being flared radially outwardly at said first end, the exterior of said housing being formed with an annular groove which is spaced a predetermined distance

from said first end, and said first end of said housing being formed with a radially inward chamfer;

elastomeric ring means disposed in said first diameter portion of said bore means for providing a seal between said conduit and said housing;

annular bushing means disposed in said first diameter portion of said bore means for positioning said ring means and for radially locating said conduit within said bore means of said housing;

cap means, demountably coupled to said first end of said housing, for cooperating with said blocking wall portion of said annular surface means to resist the disconnection of said conduit from said housing, said cap means including a first diameter section closely overfitting said housing and a second diameter section closely receiving said conduit along the portion of said conduit facing said blocking wall portion, and a pair of slots oriented along a plane transverse with respect to the longitudinal axis of said conduit;

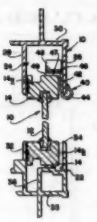
a retainer clip formed from sheet metal for removably attaching said cap means to said housing, said retainer clip comprising a pair of generally parallel elongated legs joined at one end by a cross member portion formed to provide a predetermined separation between said legs, said legs being disposed in said annular groove of said housing through said slots of said cap means, said retainer means including an inwardly directed barb disposed on each said legs generally at the end thereof.

4,526,412

SECURITY DEVICE TO PREVENT REMOVAL OF SLIDING WINDOWS AND DOORS

Alfred Gist, Rte. 1, Box 110, Bandon, Oreg. 97411

Filed Jul. 5, 1983, Ser. No. 510,630
Int. Cl.³ B65D *45/32*
U.S. Cl. 292—258 **8 Claims**



1. A security device to prevent removal of sliding windows and doors which are slidably mounted within a channeled frame structure, wherein the device comprises:

a security clip adapted to be removably attached to a depending flange of said channeled frame structure;

said security clip formed having a mainstay-wall member which projects upwardly into a channel of the frame structure adjacent the inner side of said depending flange;

a spring-tension-engaging means formed longitudinally along the lower portion of said mainstay-wall member, whereby said device is forceably retained within said channel, said spring-tension-engaging means comprising a jaw member formed in a substantially S-shaped configuration, whereby said depending flange of said frame structure is forceably received between said mainstay member and said jaw member;

an inwardly projecting, abutment-lip member formed longitudinally along the upper portion of said mainstay-wall member so as to be engaged by said window or door, when raised upwardly within said channeled frame structure, to limit the movement thereof; and

an angularly disposed ear member formed on opposite ends of said abutment-lip member to engage said depending flange of said channel, when said lip is engaged by said window or door; and

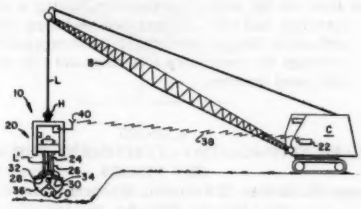
a space-control means mounted to said abutment lip to accommodate for the different spaces established between various windows or doors and their associated frame structures, so as to control the upward movement of said windows or doors within said frame structures.

4,526,413

REMOTE CONTROLLED SELF-POWERED EXCAVATOR APPARATUS

Howard G. Williams, 3727 E. Joppa Rd., Baltimore, Md. 21236

Filed Apr. 9, 1984, Ser. No. 597,938
Int. Cl.³ E02F *3/44*
U.S. Cl. 294—88 **1 Claim**



1. In a hoist line system with an operator control position thereon, remote from a frame with jaws on an end of said hoist line, and a conventional hydraulic power system with internal combustion engine and pump connected thereto, adjacent the frame and connected for responsively operating said jaws, the improvement comprising in combination: remote radio control means including a receiver adjacent the frame for controlling starting and stopping of the internal combustion system and operating the jaws for minimizing response time for operating the jaws while preserving advantages of said conventional hydraulic power system responsive operation, including means permitting use of said frame and jaws immersed in water free of injury to the receiver, internal combustion engine and pump, comprising said hydraulic power system free hanging on said hoist line in spaced relation above said frame, and a flexible elongate member connecting said hydraulic power system with said frame and providing said spaced relation.

4,526,414

FOLDABLE CARRYING DEVICE

Bobby L. Jones, 19333 Ilene, Detroit, Mich. 48221

Filed Jan. 16, 1984, Ser. No. 571,356
Int. Cl.³ A47J *51/084*; A45C *13/26*
U.S. Cl. 294—143 **18 Claims**

1. A foldable apparatus for supporting and carrying elongated tubular members comprising

first and second frame defining panel members hingedly joined to one another for movement between a relatively open supporting position wherein said panel members are

in generally inverted V-shaped configuration and a relatively closed carrying position wherein said panel members are in generally parallel configuration;

said panel members being integrally joined together at the vertex of said V-shaped configuration to define an outwardly protruding handle portion which defines an opening for grasping;

said panel members further including a plurality of ground engaging legs integrally formed in said panels and extending generally away from said outwardly protruding handle portion:

cross member means coupled between said panel members for determining the angular relationship of said panel members in said inverted V-shaped configuration; and

interchangable clip members detachably secured to at least one of said panel members for capturing and holding said tubular members,

at least one of said panel members having a plurality of openings, and said clip members including resilient and deflectable flanges insertable into and engagable with said openings for removably attaching said clip members to said panel member.

4,526,415

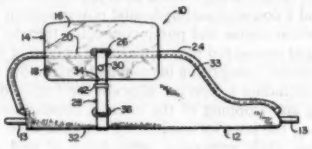
GLARE ATTENUATING ATTACHMENT FOR VEHICLE SUN VISORS

George W. Jardine, 12 Lake Rd., Waltham, Mass. 02154

Filed Dec. 15, 1983, Ser. No. 561,893

Int. Cl.³ B60J *3/00*

U.S. Cl. 296—97 F **16 Claims**



1. A glare attenuating attachment for a vehicle sun visor comprising:

a glare attenuating element including a transparent glare attenuating section, an extension section for abutting the sun visor, and a junction section for interconnecting said glare attenuating section and said extension section proximate the bottom edge of the sun visor to suspend said glare attenuating section below the bottom edge of the visor;

means for attaching said glare attenuating element to the visor including slot means disposed in said glare attenuating element and strap means receivable through said slot means and wrappable about and engageable with the top and bottom edges of said visor; and

means for permanently fastening said strap to said glare attenuating element.

4,526,416

TRUCK BODY COVER

Henry J. Rode, 7911 NW. Westside Dr., Kansas City, Mo. 64152

Filed Dec. 29, 1983, Ser. No. 567,820

Int. Cl.³ B60P *7/04*

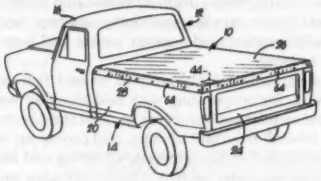
U.S. Cl. 296—100 **10 Claims**

1. A cover for an open top, cargo-receiving truck body having a pair of opposed sidewalls and a pair of opposed end walls, said cover comprising:

a flexible panel adapted to span said open top thereabove side-to-side and end-to-end of the body,

said panel having a tubular casing extending along said sidewalls and along said end walls exteriorly of the body below said top when the panel is in covering relationship to the top;

an elongated, flexible draw-element extending along said casing therewithin,



said draw-element having a pair of terminal ends disposed in proximal relationship to each other exteriorly of the casing; and

releasable means for attaching said terminal ends to the body with said draw-element drawn tightly around the side and end walls of the body.

4,526,417

BODY, PARTICULARLY FOR TRUCK, HAVING A BACK FOLDABLE SIDEWALL

Kurt Dinkel, Schwarzwaldstrasse 16, D-6980 Wertheim 2, Fed. Rep. of Germany, and Rudolf Endpess, Wertheim-Lindelbach, Fed. Rep. of Germany, assignors to Kurt Dinkel, Wertheim, Fed. Rep. of Germany

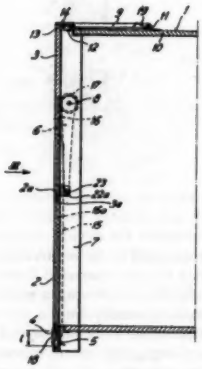
PCT No. PCT/DE83/00029, § 371 Date Oct. 14, 1983, § 102(e) Date Oct. 14, 1983, PCT Pub. No. WO83/02922, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 16, 1983, Ser. No. 550,647

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205657

Int. Cl.³ B62D *27/00*

U.S. Cl. 296—181 **8 Claims**



1. A body-structure, more particularly for trucks, comprising a lateral wall consisting of a lower part, adapted to fold down about a lower hinge-location on the body-structure, and of an upper part which is hinged at the bottom, on both sides, by a pair of links, approximately half-way up, to the adjacent side posts and, at the top, either by an additional pair of links on the roof or, on each side, to a slide adapted to be displaced along a guide-rail running on the relevant end-wall close below the roof and at right angles to the lateral walls, and which is swung upwardly by an entraining device extending from the bottom of the lower part and engaging, for example, with its two lower links when the said lower part is folded down from

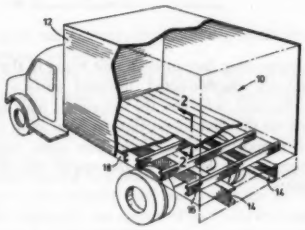
its closed position either above or below the roof, characterized in that the entraining device consists of a rack-and-pinion drive located on each side of the lateral wall and guided on side posts, the said rack being hinged, by means of a lower part, to a lever arm projecting downwardly in the closed position, from the said lower part and engaging at the top with toothing running along the outside of the hinge-location of the relevant lower link, in which toothing a pinion engages, the said pinion being secured to the said link axially of the bearing location thereof, and the pitch-diameter of the said pinion being about 1.5 times the length of the said lever-arm.

4,526,418

TRUCK FLOOR BOARD CONSTRUCTION

John C. Martin, Toronto, Canada, assignor to Diesel Equipment Limited, Toronto, Canada

Filed Apr. 3, 1984, Ser. No. 596,312
Int. Cl.³ B62D *25/20*
U.S. Cl. 296—182 **5 Claims**



1. In a truck or trailer having a floor board construction consisting of a plurality of floor cross members and a plurality of floor boards each having oppositely disposed longitudinal side edges, the floor boards being laid on the cross members with their side edges butting one another, the improvement of;

a. a groove extending longitudinally of and opening laterally from each butting longitudinal side edge of each floor board, the grooves of the butting side edges being aligned with one another to form a passage extending longitudinally of said floor boards,

b. an elongated strap mounted in said passage and extending longitudinally thereof, said strap projecting laterally into each oppositely disposed groove,

c. a plurality of mounting passages opening through said floor boards, strap and underlying cross members,

d. a mounting screw in each mounting passage, said mounting screw being threaded into its associated mounting passage of said strap and its associated mounting passage of said cross member to secure said floor boards and mounting strap with respect to said cross members.

4,526,419

BASKET AND TRAY ATTACHMENT FOR WHEELCHAIR

Albert M. Bowman, 14335 Sherman Way, #125, Van Nuys, Calif. 91405, and Roy W. Wodtke, 15523 Rayen St., #6, Sepulveda, Calif. 91343

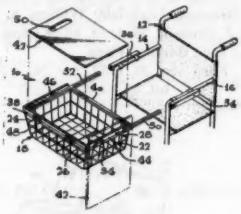
Filed Jul. 7, 1983, Ser. No. 511,526
Int. Cl.³ A47B *83/02*
U.S. Cl. 297—153 **2 Claims**

1. A basket and tray attachment comprising:

a frame, said frame having a front bar, a rear bar and first and second parallel slides extending rearwardly from said rear bar, an upstanding flange extending at least partway around said frame on said front bar and extending toward said rear bar, hooks on said slides of said frame forward of said rear bar;

a basket secured to said frame;

a tray detachably secured to said frame, said tray being sized to fit within said flange to laterally restrain said tray, said tray being sized to substantially cover said basket when said tray is laid over said basket, hook engagement means on said tray, said hook engagement means comprising an opening through said tray, said opening being sufficiently large for manual engagement so that said tray may be manually placed on said hooks and manually removed from said hooks and placed on top of said basket with one hand, said opening being sufficiently large so that when said tray is on top of said basket, materials can be passed



from the top of said tray down through said opening into said basket;

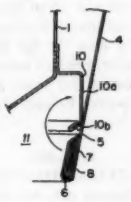
first and second tubular guides respectively slidably engaged on said first and second slides, said first and second guides being for attachment to a wheelchair so that said slides may be slidably inserted into said guides to provide cantilever support for said frame, said basket and said tray with respect to said wheelchair, said slides sliding within said guides without locks or detents so that said slides can be inserted into and removed from said guides by one-hand engagement on said basket.

4,526,420

SEAT COVER FIXING CONSTRUCTION WITH SLIMMED SECTION MOUNTING BAND

Reiki Kawamura; Takuo Tanaka; Toshio Asano, and Yasuhiro Sawada, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Takashimaya Nippatsu Kogyo Co., Ltd., both of Toyota, Japan

Filed Jan. 12, 1983, Ser. No. 457,458
Int. Cl.³ A47C *31/02*
U.S. Cl. 297—218 **6 Claims**



1. A seat cover fixing construction for fixing a seat cover to a seat having a cushion structure and a lower seat frame with an annular engagement flange extending downward from a peripheral edge portion of said lower seat frame, said cover having a central portion to cover said cushion structure and a peripheral edge portion to engage said annular engagement flange, said peripheral edge portion of said seat cover incorporating therein a resilient band shaped as an endless ribbon adapted to be inverted inside out along said annular engagement flange of said seat so as to solely engage an inside peripheral surface of said annular engagement flange while stretching said central portion of said seat cover over and around said cushion structure of said seat, said resilient band being so

shaped as viewed in its cross section to be thinner at its central portion than at its opposite edge portions wherein said lower seat frame and said annular engagement flange define an open space being at least as wide as a cross-sectional length dimension of said resilient band thereby providing space for said resilient band to be inverted after placement of said peripheral edge portion of said seat cover over said engagement flange.

4,526,421

MULTI-PASSENGER AIRCRAFT SEAT HAVING COMPOSITE PANEL FRAME

Edward J. Brennan, Litchfield; William A. Long, Harwinton, and René J. Brunelle, Wolcott, all of Conn., assignors to PTC Aerospace Inc., Bantam, Conn.

Filed Sep. 30, 1982, Ser. No. 429,340
Int. Cl.³ A47C *15/00*
U.S. Cl. 297—232 **18 Claims**

1. A multi-passenger aircraft seating unit comprising an integral composite panel frame member having a laterally extending generally flat intermediate portion and generally vertically extending front and rear portions which extend downwardly and upwardly, respectively, from said intermediate portion; said composite panel frame member having a honeycomb core with upper and lower continuous skin surfaces of resin impregnated fibrous material bonded thereto, said continuous skin surfaces having additional layers of resin-impregnated fibrous reinforcing material bonded thereto and overlying portions of said skin surfaces in spaced regions thereof to enhance the resistance of the panel to flexure and to reinforce the panel at locations where other elements of the seating unit are to be attached to it; a pair of front legs and a pair of rear legs attached to said panel frame member at spaced locations relative to each other; said panel frame member comprising the sole fore and aft structural frame element between any and all of said spaced locations; seat cushion means positioned to overlie at least the flat intermediate portion of said panel frame member; bracket means mounted to fibrous material reinforced areas of said panel, and a plurality of backrests and armrests supported by said bracket means.

4,526,422

SITTING DEVICE

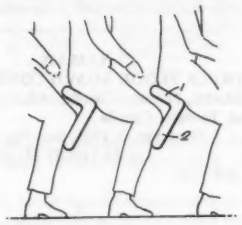
Hans C. Mengshoel, Gabels gate 41, N-Oslo 2, and Svein A. Gusrud, Tokerudberget 18, N-Oslo 9, both of Norway

Continuation of Ser. No. 143,466, Apr. 24, 1980. This application Dec. 27, 1982, Ser. No. 452,923
Claims priority, application Norway, Apr. 30, 1979, 791446
Int. Cl.³ A47C *15/00*
U.S. Cl. 297—243 **11 Claims**

1. A sitting device for use by at least first and second occupants sitting one behind the other, and facing forward comprising:

at least two identical integral and generally inverted L-shaped units supported in spaced-apart positions fixed relative to each other and disposed one behind the other with free space between them, each unit including first and second supporting faces corresponding to an upper generally horizontal leg of the inverted L-shape and the generally vertical leg thereof, respectively;

a posterior support for the first occupant being formed by the first supporting face of one unit and the second supporting face of the same unit forming a shin support for the second occupant seated on the other unit behind the first occupant, the first supporting face of the other unit forming a posterior support for the second occupant; and



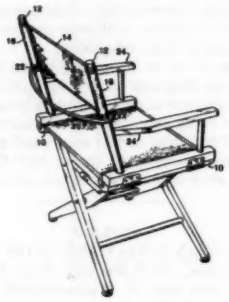
the first supporting face of each unit being in the form of a substantially unobstructed inclined surface extending across the unit, whereby the occupants may adjust their position on the first supporting faces so as to engage the second supporting faces with their shins regardless of variations in the lengths of the upper legs of different occupants.

4,526,423

BACK BRACE FOR DIRECTOR'S CHAIR

Charles I. Meinershagen, and Susan G. Weale, both of P.O. Box 705, Redding, Calif. 96099

Filed Jun. 6, 1983, Ser. No. 501,113
Int. Cl.³ A47C *7/00*
U.S. Cl. 297—440 **3 Claims**

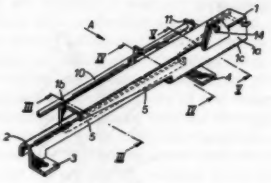


1. A brace for a collapsible chair of the type employing two substantially parallel cantilevered members, said brace comprising a wire member having a dimension substantially equal to the spacing between said cantilevered members and containing a pair of loops at the ends thereof for removable attachment around said respective cantilevered members, said wire member having a curved configuration which provides an arc which subtends a chord extending in a straight line between said respective loops thereof, said wire member being sufficiently rigid to hold said cantilevered members apart when said chair is in use.

4,526,424
SLIDE RAIL ASSEMBLY FOR A VEHICLE SEAT

Jürgen Korth, Hanover, Fed. Rep. of Germany, assignor to P.A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG, Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 494,918
Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218214
Int. Cl.³ A62B 35/00
U.S. Cl. 297—473 9 Claims



1. A slide rail assembly for mounting a vehicle seat to a floor of a vehicle, including

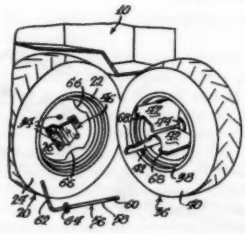
a longitudinally extending guiding rail having front and rear ends and means for mounting it at said ends to the floor of the vehicle, said guiding rail being of substantially U-shaped cross-section and having two longitudinally extending legs,

a guided rail having front and rear ends, means for connection to the vehicle seat, and means for mounting a safety belt thereto in the region of said rear end, said guided rail being of substantially U-shaped cross-section and having two longitudinal legs with free edges, each leg having a turned-in portion adjacent said free edges, which turned-in portion engages behind an adjacent one of said longitudinally extending legs of said guiding rail, one of said leg of the guided rail together with its turned-in portion being recessed adjacent one said end only of the guided rail, and the other said leg of the guided rail together with its turned-in portion being recessed adjacent to the other said end only of said guided rail.

4,526,425
DUAL WHEEL MOUNTING ARRANGEMENT

Philip W. Schroeder, Derby, Kans., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 4, 1983, Ser. No. 481,767
Int. Cl.³ B60B 11/00
U.S. Cl. 301—36 R 8 Claims



1. A dual wheel mounting arrangement, comprising:

a first wheel assembly having a first rim portion, and a hub portion adapted to be mounted on and driven by an associated axle;

a second wheel assembly having a second rim portion; and means for detachably connecting said second wheel assembly to said first wheel assembly so that said first wheel assembly is adapted to drive said second wheel assembly,

said connecting means including spoke means affixed to said second rim portion of said second wheel assembly, said spoke means being adapted to engage and coact with said first wheel assembly for driving said second wheel assembly,

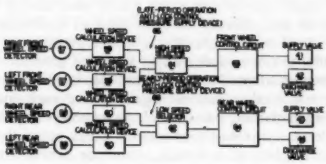
said connecting means further including releasable wheel fastener means adapted to engage said spoke means for detachably connecting said second wheel assembly to said first wheel assembly, and adapter means adapted to be fixedly mounted in association with said first wheel assembly, said adapter means being adapted to releasably receive said wheel fastener means for releasably connecting said spoke means with said first wheel assembly,

said hub portion of said first wheel assembly defining at least one opening adapted to receive a portion of said spoke means.

4,526,426
ANTI-LOCK BRAKING SYSTEM AND ASSOCIATED METHOD

Makoto Sato, Kamifukuoka, and Etsuo Fujii, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Shibuya, Japan

Filed Jun. 18, 1982, Ser. No. 390,038
Claims priority, application Japan, Jun. 25, 1981, 56-98975
Int. Cl.³ B60T 8/26, 8/02
U.S. Cl. 303—6 C 15 Claims



1. An anti-lock braking system for a four wheel vehicle having a pair of front left and right wheels and a pair or rear left and right wheels, each wheel having a respective brake cylinder for applying braking pressure to the wheel in response to pressure fluid supplied from a master cylinder, said anti-lock braking system comprising: first high-select type anti-lock control means associated with one pair of wheels for supplying a control pressure upon locking of one of said wheels of said one pair later than the other wheel of said one pair, second low-select type anti-lock control means associated with the other pair of wheels for supplying a control pressure upon locking of at least one of the wheels of said other pair, first regulating means coupled to one of said anti-lock control means for simultaneously controlling braking pressures in the wheel cylinders of the left and right front wheels in response to supply of control pressure from said one anti-lock control means, second regulating means coupled to the other of said anti-lock control means for simultaneously controlling braking pressure in the wheel cylinders of the left and right rear wheels in response to supply of control pressure from said other anti-lock control means, a dual hydraulic circuit arrangement including a first hydraulic circuit for supplying pressure fluid from said master cylinder via said first and second regulating means to one of the two front wheel cylinders and one of the two rear wheel cylinders and a second hydraulic circuit for supplying pressure fluid via said first and second regulating means to the other front wheel cylinder and the other rear wheel cylinder, fluid pressure control valve means in said first and second hydraulic circuits for controlling the pressure supplied to the front and rear wheel cylinders in proportion to load distribution on the front and rear wheels, and a second source of fluid pressure connected to said first and second

regulating means respectively by said first and second anti-lock control means.

4,526,427

APPARATUS FOR FASTENING INSTRUMENTS IN A FRONT PANEL OR SWITCHBOARD

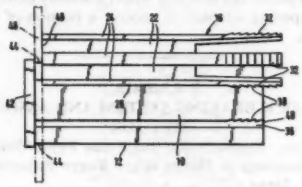
Rudi Boll, Im Wolfsgrund 27C, 7826 Schluchsee; Arno Tetzlaff, An der Haslach 7, 7825 Lenzkirch, and Gerhard Steidle, Bogenstrasse 1, 7737 Bad Dürrheim 4, all of Fed. Rep. of Germany

Filed Apr. 19, 1983, Ser. No. 486,351

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214528

Int. Cl.³ F16B *12/00*

U.S. Cl. 312—111 17 Claims



1. Apparatus for fastening instruments in an opening in a front panel, each instrument having a casing and a cover plate projecting laterally beyond the casing in order to abut against the outer side of the front panel, said casing formed with grooves respectively on both sides of each side edge which extends at right angles to the cover plate, each groove being parallel to the said side edge, a tongue member on a common connector adapted to be inserted into each of the two grooves near a side edge, and each groove and each tongue member having anchoring parts which on insertion are adapted to snap resiliently one into the other and which act in the longitudinal direction thereof, and each connector, when inserted, bearing against the inner side of the front panel.

4,526,428

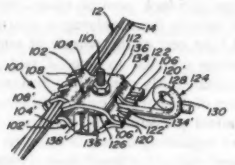
MULTI-STRAND CABLE CLAMP WITH POSITIVE STRAND ENGAGEMENT

Isaac Sachs, 1240 Ridgewood Dr., Chomedey, Laval, Quebec, Canada H7W 1L3

Filed Mar. 30, 1984, Ser. No. 595,480

Int. Cl.³ H01R *4/66*

U.S. Cl. 339—14 R 20 Claims



1. In a multi-strand cable clamp comprising a pair of opposingly disposed plate members each having an edge bent to define a jaw means for gripping a multistrand cable, said plate members being articulated to one another for moving said jaw means between open and closed positions, and releasable coupling means interconnecting said plate members and operable to bias said jaw means to said closed position for releasably securing said cable in clamping engagement between said jaw means, the improvement wherein said edge of each said plate member is formed with a tooth which is inclined relative to the longitudinal axis of said cable so as to engage said cable between two successive outer strands thereof, thereby providing a positive strand engagement and preventing said plate members from pivoting about said cable and sliding therealong.

4,526,429

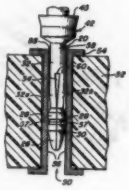
COMPLIANT PIN FOR SOLDERLESS TERMINATION TO A PRINTED WIRING BOARD

Michael Kirkman, Barrington, R.I., assignor to Augat Inc., Mansfield, Mass.

Filed Jul. 26, 1983, Ser. No. 517,510

Int. Cl.³ H01R *9/09, 13/41, 15/08*

U.S. Cl. 339—17 C 11 Claims



1. A low insertion force electrical interconnection resilient pin adapted for use with plated through-holes of varying size in a printed wiring board to provide good electrical connection between the leads of externally mounted components or wires and the printed wiring board holes comprising:

a pin having an enlarged diameter proximal end and a reduced diameter distal end, said enlarged diameter proximal end including a tapered nose having an annular groove therein, said distal end having a shaft and means at the end of said shaft for making electrical contact to said leads or wire;

a portion of said shaft, said contact portion and said nose having a slot therethrough running from one side of said pin to the other for a length which includes said annular groove for dividing said shaft portion, said annular groove and said nose into two spaced apart portions, said slot thereby providing two spaced apart spring members, the spring moment applied to said spring members being sufficient to provide metal flow into said annular groove upon insertion of said resilient pin into a plated printed wiring board through-hole.

4,526,430

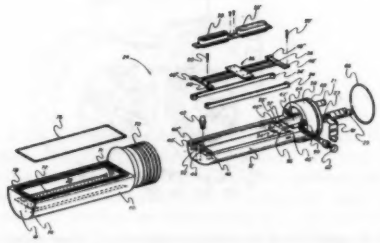
MARINE SEISMIC CABLE CONNECTOR

Shandton D. Williams, Houston, Tex., assignor to Litton Research Systems, Inc., Alvin, Tex.

Filed Nov. 14, 1983, Ser. No. 551,164

Int. Cl.³ H01R *13/629, 25/00, 13/58*

U.S. Cl. 339—45 M 5 Claims



1. An improved waterproof connector having a free end and a fixed end for electrically and mechanically coupling together adjacent marine streamer-cable sections, each said section including a tubular plastic outer jacket, secured to the fixed

end of the connector, that contains a plurality of sensors, a plurality of electrical conductors for transmitting sensor signals, at least one stress member, the jacket further including a volume of buoyant liquid therein, the connector comprising:

a semicylindrical outer shell that defines an elongated semicylindrical cavity closed at the free end, the shell including a hollow partially closed cylindrical portion at the fixed end abutting said cavity;

a stress plate assembly having fixed and free ends, the assembly including a retractably extendable connector plate upon which are mounted a plurality of multiple contact plugs to which said conductors are connected, said connector plate having a retracted position and an extended position within said stress plate, the plugs being arranged in hermaphroditic configuration, the stress plate being slidably mounted within the cavity of said outer shell;

a floatingly mounted jack screw inserted through the free end of said connector for forcibly-disengagingly engaging a mating connector from an adjacent cable section;

at least one shear lug removably mounted at the free end of the stress plate of a first connector, mateable with a socket at the fixed end of a stress plate of a mating connector, for transferring stresses from the stress plate of said first connector to the stress plate of a second mating connector of an adjacent cable section; and

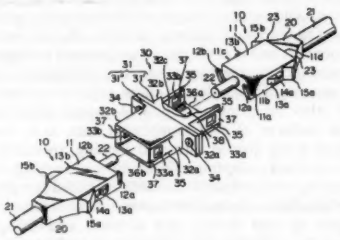
a removable riser bar mountable beneath each side of said connector plate for supporting said connector plate in the extended position.

4,526,431

CONNECTOR WITH MECHANISM FOR COUPLING AND UNCOUPLING PLURALITY OF BLOCKS

Yasuhiko Kasukawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,277
Claims priority, application Japan, Feb. 14, 1983, 58-22349
Int. Cl.³ H01R *13/635*
U.S. Cl. 339—45 R **12 Claims**



1. A connector for coupling and uncoupling a plurality of connector blocks, comprising:

a first connector block having a housing which is provided, on a pair of opposite walls thereof, with a pair of outwardly extending lugs and a pair of sliders which are individually movable along said opposite walls;

a second connector block having a housing which is provided, on a pair of opposite walls thereof, with a pair of frame-like flexible arms which are respectively engageable with the lugs on the first connector block; and

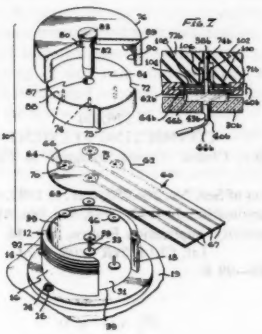
resilient deformation means for exerting a restoring force to cancel a coupled condition between the first and second connector blocks when the sliders of the first connector block are brought into engagement with the flexible arms of the second connector block, said resilient deformation means being resiliently deformed in contact with part of one of the first and second connector blocks when the first and second connector blocks are coupled with each other with the lugs and the flexible arms engaged with each other.

4,526,432

ELECTRICAL CONNECTOR ASSEMBLY FOR FLAT CABLES

Michael J. Cronin, Sherman Oaks, and Victor W. Hamra, North Hollywood, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Dec. 26, 1979, Ser. No. 107,260
Int. Cl.³ H01R *13/621*
U.S. Cl. 339—75 M **9 Claims**



1. An electrical connector assembly comprising:

a receptacle having a surface and a pattern of first contact pads mounted to said surface terminating first electrical conductors, said pads having pins protruding therefrom;

a flat cable having first and second sides and a pattern of second contact pads mounted on a portion of said first side terminating second electrical conductors, said pattern of second contact pads having positions that are complementary to said first contact pads, said second contact pads and said cable having apertures adapted to receive said pins;

securing means adapted to urge said first and second contact pads together to electrically connect said first and second conductors; and

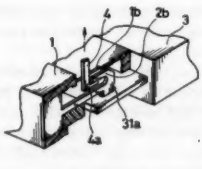
wiper means adapted to be secured to said pins and to wipe both said first and said second contact pads when under compression.

4,526,433

CONNECTOR WITH A LOCKING MECHANISM

Masanori Tanaka, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Japan

Filed Oct. 14, 1983, Ser. No. 541,919
Claims priority, application Japan, Oct. 20, 1982, 57-159958
Int. Cl.³ H01R *13/639*
U.S. Cl. 339—75 MP **8 Claims**



1. A connector for an electronic part, having a locking mechanism comprising an engaging piece concealed interiorly of the connector and forming at least part of a conductive terminal in the connector, the engaging piece having a abutment for effecting a locking engagement with the electronic part and a catch for engagement with a special tool for releas-

ing the locking engagement, the connector having a through hole formed in an outer wall thereof through which the tool may be inserted, and the engaging piece having means for permanently disrupting electrical contact between the electronic part and the connector upon forced disconnection of the connector from the electronic part, whereby unauthorized disconnection renders at least one of the connector and the electronic part unusable.

4,526,434

CONNECTING ELEMENT

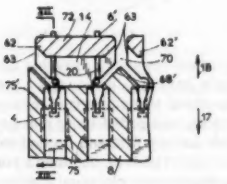
Yves Saligny, Cluses, France, assignor to Carpano & Pons, France

Continuation of Ser. No. 366,752, Apr. 8, 1982, abandoned. This application Jun. 13, 1984, Ser. No. 619,687

Claims priority, application France, Apr. 16, 1981, 81 07661

Int. Cl.³ H01R *9/08, 4/24*

U.S. Cl. 339—99 R **2 Claims**



1. A connector comprising a plurality of assemblies arranged in pairs, each assembly comprising:

a. a plate having

a connecting part;

two opposed members affixed to said connecting part and having faces terminating in a free side respectively;

a passageway extending through said faces and defined by a first edge formed in the respective faces directed toward said free side and a second edge opposing said first edge;

an operating groove on one of said faces; and engaging means; and

b. a plug being constructed and arranged to be captured between said faces by said engaging means in a first position and having a conducting element adapted to engage and strip a wire disposed in said passageway when said plug is pushed into a second position toward said connecting part and to disengage from said wire when said plug is in said first position; the plates of each assembly being disposed in parallel with each other;

two adjacent assembly pairs being separated by a lateral slot communicating with the respective passageways of the adjacent assembly plates;

whereby a wire is inserted into the assembly by passing it from the direction of said connecting part through said lateral slot to said passageway, while said plug is in said first position; and moving said plug into said second position so that said first edge forces said wire into contact with said conductor member; and

whereby a wire is removed from the assembly by moving said plug into said first position by the use of said operating groove so that

said second edge forces said wire away from said conducting elements and then passing said wire through said lateral passage toward said connecting part.

4,526,435

CABLE CLAMPING DEVICE

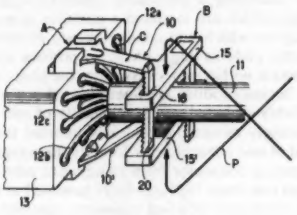
André Borne, Villeurbanne; André Marmonier, Bron, and Ariel Ruiz, Villeurbanne, all of France, assignors to CGEE Alsthom, France

Filed Aug. 25, 1982, Ser. No. 411,385

Claims priority, application France, Aug. 28, 1981, 81 16429

Int. Cl.³ H01R *13/58*

U.S. Cl. 339—103 C **1 Claim**



1. A device for attaching a multiple conductor cable perpendicularly to the end of equipment to which the conductors of said cable are to be connected, said device comprising a hermaphroditic assembly of two identical T-shaped components, each of which has a fixing section adapted for removable fixing to one of opposite sides of said equipment at said end, a semi-rigid link extending integrally from said fixing section and in line therewith, terminating beyond the end of said equipment to present for said components flexible links facing each other, and a cable clamping section integral with said semi-rigid link at the end remote from said fixing section and beyond the end of said equipment, said cable clamping section comprising a bar joined at its center to said link and being perpendicular to said link, said bar having on one side a rough surface for retaining said cable, a lengthwise notched tongue projecting perpendicularly from said one side of said bar at one end thereof and said bar, at its other end, bearing a co-operating locking aperture, whereby said notched tongue of a first of said components may be locked into said locking aperture of said second of said components and said tongue of said second component locked into said locking aperture of said first component, and wherein said semi-rigid links flex to allow said bars to move towards each other for gripping cables of various sizes between said rough surfaces of said component bars as a result of said tongues being forced into said locking apertures, with said semi-rigid links adapting to equipment of varying widths while permitting movement of the cable captured therebetween in a plane parallel to the end of the equipment at which the cable is gripped by said device, and wherein said fixing section is formed by a widened portion adapted to engage with a T-shaped slot formed by two lugs on said equipment, said semi-rigid link being adapted for insertion between said lugs and said fixing section terminating in a further laterally widened portion acting as a stop, and wherein said widened portion comprises a tab projecting toward said equipment, whereby said component is locked to said equipment.

4,526,436

ELECTRICAL CONNECTOR FOR FLAT FLEXIBLE CABLE

Akira Aso, Lisle, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Dec. 5, 1983, Ser. No. 558,138

Claims priority, application Japan, Dec. 10, 1982, 57-215435

Int. Cl.³ H01R *9/07*

U.S. Cl. 339—176 MF **7 Claims**

1. A connector assembly for electrically connecting the conductors of a flat flexible multi-conductor cable to another circuit member, said connector assembly including

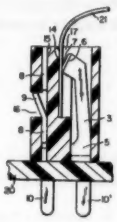
a housing having a plurality of side by side, elongated, open ended terminal receiving cavities formed therein, a slot

formed across the open ends of the cavities for receiving the edge of exposed cable conductors therethrough, and

a plurality of stamped, formed electrical terminals formed from flat metal conductive material, each terminal having a generally planar, U-shaped terminal body with first and second arms extending up from the base of said body and having a portion extending in the opposite direction from the base for electrical connection to the other circuit member, at least one arm having a contact surface formed near the free end thereof for making an electrical interface with the cable conductor when said cable is received in the housing slot and in the area between the two arms, said terminal further including mounting means cooperating with the housing for securing a terminal therein,

the improvement comprising:

the first arm including a hook-shaped engaging portion having the contact surface formed thereon that is disposed



substantially vertical to and in a projecting relation from the plane of said first arm at an acute angle relative to the longitudinal axis thereof;

said second arm having a lateral flange portion extending substantially the whole length of said second arm and projecting at a right angle with respect to the plane of said second arm;

each terminal receiving cavity including a terminal supporting portion defining a L-shaped slot immediately adjacent to and transverse to the cable receiving slot;

said flange portion being received on one side of the terminal supporting portion and the hook-shaped engaging portion having its contact surface biased against the other side of said contact supporting portion;

whereby said cable conductor is adapted to be received in the slot so that it is disposed between said contact surface and said contact supporting portion.

4,526,437

ELECTRICAL BRACKET

Anton M. Kies, Oisterwijk, Netherlands, assignor to Erico Products, Inc., Cleveland, Ohio

Filed Mar. 17, 1983, Ser. No. 476,227
Int. Cl.³ H01R 4/36
U.S. Cl. 339—272 R **6 Claims**

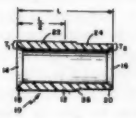
1. An electrical bracket for clamping a lead wire and ground rod in electrical contact and parallel to each other, said bracket being formed of a bent resilient sheet metal web and forming a wire and rod receiving portion in the general form of a closed hexagonal shape, said web including at one end of said closed hexagonal receiving portion two semi-cylindrical end portions having screw threads on the interior thereof cooperating to form an internally threaded bore extending generally normal to the axis of the ground rod, each semi-cylindrical end portion including a flared outer end which flared ends together form a rim, a screw threaded element adapted to be received in said internally threaded bore whereby tightening of the screw threaded element will clamp the rod and wire together between the end of the screw threaded element and the opposite end of the hexagonal wire and rod receiving portion, and a ring extending around said two semi-cylindrical end portions to restrict the opening of said end portions when said screw threaded element is threaded into said internally threaded bore and to maintain the screw threads on the interior of said semi-cylindrical end portions in proper threaded engagement with the threads of the screw threaded element, said sheet metal web being sufficiently resilient so that the semi-cylindrical end portions may be forced together when the screw threaded element is not present to permit said ring to be inserted over said rim.

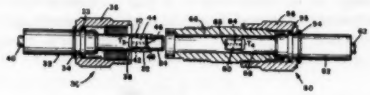
4,526,438

ALIGNMENT SLEEVE FOR FIBER OPTIC CONNECTORS

Robert D. Essert, Poughkeepsie, N.Y., assignor to Allied Corporation, Morris Township, N.J.

Filed May 13, 1983, Ser. No. 494,466
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **11 Claims**





7. An alignment sleeve for a fiber optic connector having a first terminal pin adapted for receiving a first optical fiber, said optical connector being adapted to mate with a second fiber optic connector having a second terminal pin adapted for receiving a second optical fiber, said sleeve comprising:

a resilient tubular body having openings at both ends thereof and adapted to be fitted over said first terminal pin and said second terminal pin,

said tubular body having a first portion of a first thickness extending over a portion of the length of said body and a second portion having a second thickness less than said first thickness, said second portion extending over the remaining length of said body,

the length of said first portion being greater than the length of said first pin when said tubular body is fitted over said first pin such that when said sleeve is fitted over said second terminal pin, said second portion of said tubular body and a portion of said first portion of said tubular body extends over said second terminal pin.

4,526,439

THREE-DIMENSIONAL IMAGE DISPLAY APPARATUS AND A SCREEN THEREFOR

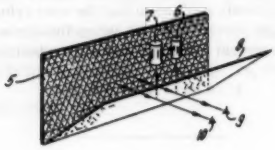
Takanori Okoshi, 7-7, 3-chome, Sengoku, Bunkyo-ku, Tokyo, Japan, and Makoto Okoshi, deceased, late of Tokyo, Japan (by Takanori Okoshi, legal representative)

Continuation of Ser. No. 376,735, May 10, 1982, which is a continuation of Ser. No. 112,191, Jan. 15, 1982, Pat. No. 4,329,019, which is a continuation of Ser. No. 42,614, May 25, 1979, abandoned, which is a continuation of Ser. No. 884,845, Mar. 9, 1978, abandoned, which is a continuation of Ser. No. 524,218, Dec. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 372,001, Jun. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 808,223, Mar. 18, 1969, abandoned. This application Mar. 28, 1984, Ser. No. 594,410

Claims priority, application Japan, Mar. 21, 1968, 43-18482

Int. Cl.[3] G03B *21/60*

U.S. Cl. 350—128 32 Claims



1. A screen on which a three-dimensional image is desplayed with beams of light rays projected from projecting means, comprising a plurality of reflectors which are so formed and arranged in the screen that each reflector consists of three reflecting surfaces arranged to intersect at a common point, two of which are flat and intersect at right angles to each other in a line perpendicular to a parallax direction of said three-dimentional image being displayed on the screen, and the other one of which is parallel to said parallax direction and is cylindrical with respect to said parallax direction, the curvatures of all the cylindrical reflecting surfaces being made so equal to one another and being so progressively varied that said beams of parallel rays of light incident upon the screen from said projecting means are reflected and diffracted in planes perpendicular to the parallax direction in directions continuously deviated from the direction opposite to that in which said beams are projected, to thereby permit said three-dimentional image to be observable to a pair of human eyes located at substantial distances from the projecting means in the vertical direction.

4,526,440

FASTENING DEVICE FOR INTERCHANGEABLE PROJECTION LENS

Jan A. Lundberg, Torslanda, Sweden, and Rolf G. Fransson, Angered, both of Sweden, assignors to Victor Hasselblad Aktiebolag, Gothenburg, Sweden

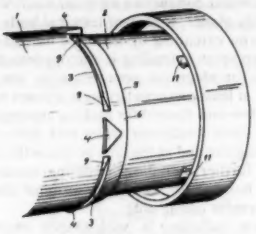
Filed May 18, 1983, Ser. No. 495,641

Claims priority, application Sweden, Jun. 15, 1982, 8203709

Int. Cl.[3] G03B *17/00*

U.S. Cl. 350—257 4 Claims

1. A device for detachably attaching a lens tube on a lens barrel, having an outer surface comprising: said lens barrel having a forward free edge and said outer surface adjacent said free edge having at least two peripheral grooves located in the same plane, each of said grooves having a bottom having ends which are inclined in said plane to the outer surface of the barrel, said barrel outer surface tapering substantially conically from said grooves to the free edge of the barrel, said barrel further including a guide shoulder on said outer surface tapering wedge-shaped toward said free edge between two adjacent said grooves, and the tube being provided with radially resilient hooks capable of engaging with the grooves of the barrel when said tube is mounted on said barrel, respective guide shoulders interacting with respective hooks to axially out-



wardly move said tube with respect to said barrel, upon rotation of said tube with respect to said barrel.

4,526,441

METHOD AND ELECTROLYTIC DISPLAY FOR SELECTIVELY DISPLAYING AN IMAGE

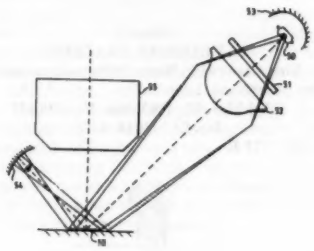
Barry F. Dowden, Romsey; Donald J. Barclay, and David H. Kirkman, both of Winchester, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 7, 1982, Ser. No. 375,905

Claims priority, application European Pat. Off., Jun. 30, 1981, 81302961.8

Int. Cl.[3] G02F *1/19, 1/17*

U.S. Cl. 350—357 9 Claims



1. A method of selectively displaying an image comprising the steps of:

writing the display by reversibly electrodepositing a light scattering deposit on a substantially non-scattering opaque surface in the desired image configuration, illuminating the display in reflection from a particular direction, whereby incident light is scattered out of the specular direction by written areas; and

projecting a non-specular component of the emergent light to form the image.

4,526,442
COMPACT PROJECTION LENS

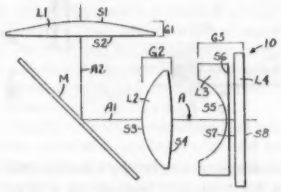
Ellis I. Betensky, New York, N.Y., assignor to U.S. Precision Lens, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 228,012, Jan. 28, 1981, Pat. No. 4,348,081, which is a continuation-in-part of Ser. No. 070,748, Sep. 4, 1979, Pat. No. 4,300,817, which is a continuation-in-part of Ser. No. 940,724, Sep. 6, 1978, abandoned. This application Jul. 6, 1981, Ser. No. 280,785

The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.[3] **G02B** *9/12, 13/18, 27/18*

U.S. Cl. 350—412 **27 Claims**



1. A projection lens for a cathode ray tube display, said lens consisting of three groups from the image end to the object end, as follows:

a first group comprising an element of relatively weak optical power having at last one aspheric surface;

a second positive group air spaced from said first group providing substantially all the positive power of said lens;

a third group air spaced from said second group and comprising a negative element having a surface concave to the image end and serving as a field flattener essentially correcting the Petzval curvature of the first and second groups;

wherein said three groups have optical powers **K1**, **K2**, and **K3**, the overall lens has an optical power of 1.0, and

$$0.25 < K1 < 0.50,$$

$$0.85 < K2 < 1.20,$$

$$-1.4 < K3 < -0.9$$

4,526,443
TELECENTRIC ILLUMINATION SYSTEM

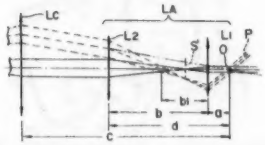
Hideo Hirose, Kawaguchi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 14, 1982, Ser. No. 418,031

Claims priority, application Japan, Nov. 4, 1981, 56-176828

Int. Cl.[3] **G02B** *13/22, 15/14, 21/06*

U.S. Cl. 350—415 **5 Claims**



1. A telecentric illumination system for telecentrically illuminating an object, comprising:

telecentrically illuminating optical means having a light source and field stop means for substantially restricting the object field to be illuminated, said optical means supplying a parallel light beam to said object and forming an image of said field stop means on said object, and

an auxiliary condenser lens means removably disposed between said telecentrically illuminating optical means and said object, said auxiliary condenser lens means having a first convergent lens group and a second convergent lens group disposed with a spacing therebetween corresponding to the sum of the focal lengths thereof, and said auxiliary condenser lens means forming an image of said light source between said first and said second convergent lens groups and maintaining the image of said field stop means on the object when said auxiliary condenser lens means is inserted between said telecentrically illuminating optical means and said object to be illuminated.

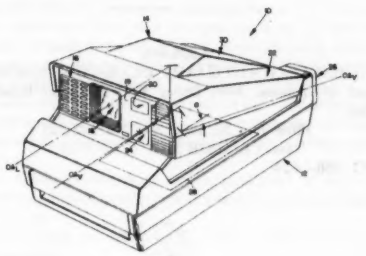
4,526,444
VIEWFINDER APPARATUS

Stephen D. Fantone, Saugus, Mass.; Robert M. Goward, Concord, N.H., and Jonathan I. Kaplan, West Newton, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 2, 1984, Ser. No. 595,715

Int. Cl.[3] **G02B** *23/08, 23/10, 23/14;* **G03B** *13/06*

U.S. Cl. 350—501 **15 Claims**



1. A viewfinder assembly for use with a photographic camera, said assembly comprising:

an elongated, open-ended housing;

a first lens group consisting of at least one element of negative power positioned in said housing;

a second lens group consisting of at least one element of positive power positioned in said housing, the powers of said first and second lens groups, and the spacing therebetween being such that said lens groups in combination are convergent, forming a real image in a predetermined plane within said housing located behind said second lens group;

a third lens group consisting of at least one element of positive power positioned in said housing; and

a fourth lens group consisting of at least one element of positive power positioned in said housing, the powers of said third and fourth lens groups and the spacing therebetween being such that said third and fourth lens groups form a substantially collimated image of said real image formed by said first and second lens groups,

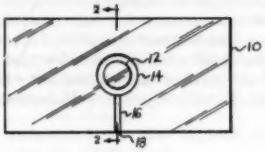
said housing having positioned therein and said lens groups having positioned thereon complementary configured snap-type connecting means structured to automatically connect said lens groups in said housing so that said lens groups are automatically arranged with respect to one another along an optical path within predetermined tolerances upon connection with said housing.

4,526,445

OPTICAL WINDOW WITH VACUUM FILM HOLDER

Frank Wogoman, South Bend, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 5, 1983, Ser. No. 491,992
Int. Cl.[3] G02B 21/34; B25B 11/00
U.S. Cl. 350—534 6 Claims



1. Apparatus for mounting a specimen for analysis over an optical viewing area, which apparatus comprises:

a plate, with an optical window extending therebetween, said optical window having parallel top and bottom sides and a thickness not exceeding about 0.07 inch;

a vacuum trough, open at the top side of said plate and extending completely around said optical window, for holding a specimen flat against the optical window during analysis; and

a vacuum tube interconnecting the vacuum trough with a vacuum port in the edge of said plate.

4,526,446

ADJUSTABLE AUXILIARY REAR-VIEW MIRROR

Richard W. Adams, 3404 Dover Rd., Pompano Beach, Fla. 33062

Filed Jun. 20, 1983, Ser. No. 505,925
Int. Cl.[3] G02B 5/08, 5/10, 7/18
U.S. Cl. 350—624 7 Claims

1. An auxiliary rear-view mirror for adhesive attachment to the flat rear face of a larger outside rear-view mirror on a vehicle, said auxiliary mirror comprising:

a circular wedge-shaped base having a flat front end wall for adhesive attachment to the larger rear-view mirror, and a cylindrical wedge-shaped side wall extending rearward from said front end wall at an oblique angle to the latter;

an adjusting ring extending rearward from said base and having a cylindrical wedge-shaped side wall coupled to said side wall of the base for rotatable adjustment on the base about an axis which extends at an oblique angle to said front end wall of the base;

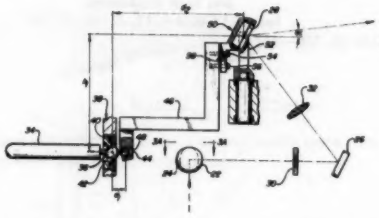
and a mirror piece on the back end of said ring, said mirror piece having a rearwardly facing convex reflective face of which is spherical about an axis which extends at an acute angle to said axis about which the ring is rotatably adjustable.

4,526,447

BEAM DIRECTING MICROMANIPULATOR FOR LASER DEVICE

Wilhelm Taylor, Colorado Springs, Colo., assignor to Xanar, Inc., Colorado Springs, Colo.

Filed May 7, 1983, Ser. No. 493,091
Int. Cl.[3] G02B 7/18, 17/00
U.S. Cl. 350—636 2 Claims



1. In an optical system employing a manipulable beam redirecting means for guiding a beam along a target surface, a distortion correcting micromanipulator for manipulating said redirecting means, and in turn said beam on said surface, comprising:

(a) yoke means for changing said beam redirecting means and providing said redirecting means with two degrees of rotational freedom;

(b) an extension arm affixed on a proximate end to said beam redirecting means, and terminating freely movably at a distal end, movement of said distal end producing corresponding rotational movement of said redirecting means;

(c) a manipulator lever having a handle on one end, an intermediate fulcrum, and a terminus on the other end; and

characterized in that

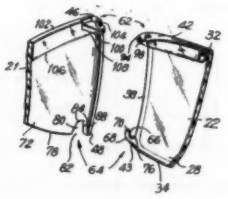
(d) said extension arm defines on its distal end, an elongated channel adapted to receive said terminus of said lever, said channel having predetermined angular displacement corresponding to the rotational degree of freedom of said redirecting means to be distortion corrected, said terminus being slidably engaged within said channel, relative slippage along said angular displacement providing corresponding corrected rotation of said beam redirecting means.

4,526,448

VISITOR SPECTACLES

George N. Hanson, New York, N.Y., assignor to Eastern Safety Equipment Co., Inc., Long Island City, N.Y.

Filed Sep. 9, 1982, Ser. No. 416,193
Int. Cl.[3] G02C 5/22, 5/14
U.S. Cl. 351—153 7 Claims



1. An improved assembly for protective spectacles of the type comprising a lens body made of a resilient material and a pair of temple members rotatably connected to the lens body, the lens body including a pair of lenses having front and rear surfaces, each lens having a side rim with top and bottom portions, each temple member including a protective side wall

having a front edge with an upper portion and a lower portion and an enlarged horizontal bar extending inwardly from said side wall, said temple member being rotatable between an open position wherein the temple member is substantially transverse to the lens body and a closed position wherein the temple member is substantially lateral to the lens body, a side edge of said temple member being in juxtaposition with the side rim of said lens body in the open position and spaced from the side rim of the lens body in the closed position, the improved assembly, in combination, comprising:

first and second means for rotatably connecting each said temple member to said lens body for rotation between said open and closed positions,

said first means including a pin and hole connection for rotatably connecting said top portion of said side rim of said lens body with said upper portion of said front edge of said side wall of said temple member, said first means exerting a downward pressure from said lens body on said temple member, and said temple member exerting an upward pressure on said lens body,

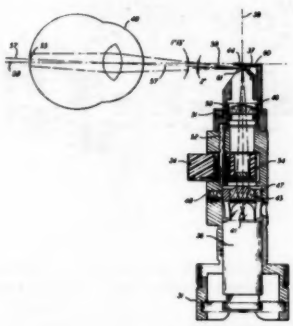
said second means rotatably connecting said bottom portion of said side rim of said lens body with said lower portion of said front edge of said wall, said second means including hook means having a rounded pivoting surface connected to said bottom portion of said side rim, said wall having a bottom edge intersecting said side edge, said wall forming a first rounded recess rotatably conforming to said rounded surface of said hook means, and disposed at said bottom edge, said first recess having a downwardly facing opening and an inner surface, said hook means being for engaging said first recess in rotatable connection and for exerting an upward pressure against said inner surface of said first recess substantially equal to the downward pressure exerted by said first means.

4,526,449

OPTICAL SYSTEM FOR ILLUMINATED VIEWING INSTRUMENTS

Richard W. Newman, Auburn; William C. Moore, and Byron A. Richards, both of Skaneateles, all of N.Y., assignors to Welch Allyn Inc., Skaneateles, N.Y.

Filed Aug. 16, 1982, Ser. No. 408,631
Int. Cl.³ A61B 3/14
U.S. Cl. 351—205 **10 Claims**



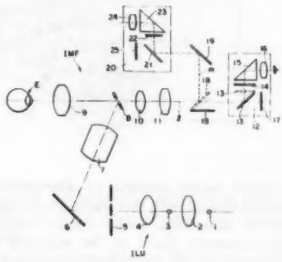
1. An optical system comprising a light source having an arcuate filament, light reflecting means spaced from the light source and disposed at an oblique angle to the longitudinal axis thereof, the light reflecting means having a relatively small arcuate viewing passage formed in one edge thereof, and means forming a part of the optical system to project light rays from the light source onto the reflecting means in an in focus arcuate image that is close to and substantially concentric with the viewing passage.

4,526,450

EYE FUNDUS CAMERA

Toru Suzuki; Eiichi Sano, and Yoshihiko Hanamura, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1983, Ser. No. 532,994
Claims priority, application Japan, Sep. 16, 1982, 57-159428
Int. Cl.³ A61B 3/14; G03B 29/00
U.S. Cl. 351—206 **5 Claims**



1. An eye fundus camera comprising:

an illuminating optical system for illuminating the fundus of the eye to be inspected;

an image forming optical system having a first path of light in which the rays of light from the fundus of the eye can travel for forming an image of the fundus of the eye;

a movable reflecting member movable betwen a first position within said first path of light and a second position outside of said first path of light, said reflecting member forming a second path of light branching off from said first path of light when placed in said first position;

first means provided in said first path of light and behind said movable reflecting member for observing and/or photographing said image formed by said image forming optical system;

second means provided in said second path of light for observing and/or photographing said image of the fundus of the eye;

actuating means for actuating said first or second means to photograph;

control means connected with said actuating means for controlling the movement of said movable relecting member between said first and second positions, said control means including: first control means for normally keeping said reflecting member in said second position, inserting said reflecting member into said first position as said actuating means actuates said second means, and after a definite time interval moving said reflecting member into said second position; and second control means for normally keeping said reflecting member in said first position, moving said reflecting member into said second position as said actuating means actuates said first means, and after a definite time interval moving said reflecting member into said first position; and

changeover switch means for selectively actuating said first or second control means.

4,526,451

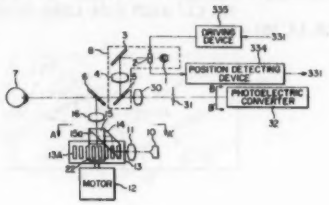
APPARATUS FOR MEASURING THE REFRACTIVE POWER OF AN OPTICAL SYSTEM

Masao Nohda, Yokosuka, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,598
Claims priority, application Japan, Apr. 4, 1981, 56-50790
Int. Cl.³ A61B 3/10
U.S. Cl. 351—211 **8 Claims**

1. An apparatus in which an optical system to be examined is periodically scanned by a slit-like illuminating light beam and

light emanating from the optical system in response to the scanning is received by two pairs of photoelectric converters and the refractive power of said optical system is measured on the basis of the phase difference between the output signals of the photoelectric converters forming each of said pairs, said apparatus including:



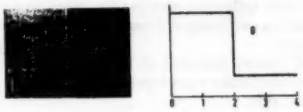
projection means capable of alternatively scanning said optical system with said illuminating light beam from two known directions, output means adapted to produce a discrimination signal of the scanning direction of said illuminating light beam, and operational means for receiving said discrimination signal and said phase difference as inputs and determining the refractive power of the optical system.

4,526,452

METHOD AND APPARATUS FOR MEASURING CONTRAST SENSITIVITY

Joy Hirsch, New Haven, Conn., assignor to Interzeag AG, Schlieren, Switzerland

Filed Jun. 8, 1982, Ser. No. 386,434
Int. Cl.³ A61B *3/02*
U.S. Cl. 351—243 **21 Claims**



1. A method of testing the ability of a subject to visually perceive a transition edge between adjacent fields of different luminance, said method comprising the steps of:

establishing a plurality of visual test patterns each of which includes only two adjacent fields of different luminance defining a single transition edge at the interface between the adjacent fields, the adjacent fields defining different transition edges from test pattern to test pattern;

presenting to the subject a serious of successive visual test patterns of said plurality of visual test patterns; and

monitoring the ability of the subject to perceive the single transition edge between the fields for each of said series of successive patterns.

4,526,453

METHOD OF AND APPARATUS FOR DISTINGUISHING BETWEEN EXPOSED AND UNEXPOSED FILM UNITS

Bruce K. Johnson, Andover, and Anthony J. Schettino, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

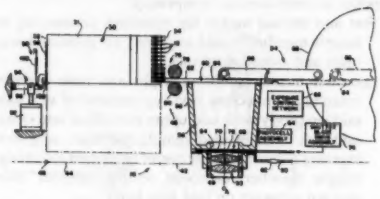
Filed May 2, 1983, Ser. No. 490,316
Int. Cl.³ G03B *19/10*
U.S. Cl. 354—181 **19 Claims**

1. A film cassette for use with a camera, said film cassette comprising:

an open faced casing;

a plurality of film units, each having a light sensitive area, stacked in said casing with a given edge portion of each presented at said open face for facilitating sequential removal of each within a camera for exposure; and,

a light attenuating member located between adjacent film units and extending across the light sensitive area thereof so as to attenuate transmission of light to said light sensitive area of any of the undeveloped film units responsive to removal of a film unit whereby said cassette may be exposed to light following removal of one or more film



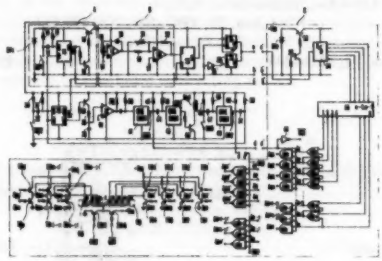
units, but prior to exposure and development of all units, without admitting light to the light sensitive areas of the remaining film units wherein said light attenuating member is fixed within said casing so as to define therewith a separate compartment for each film unit having a compartment opening formed at the open face of said casing, and said given edge of said film unit is configured for cooperating with said compartment opening to light seal each said compartment prior to removal of its film unit.

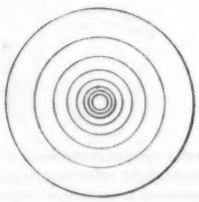
4,526,454

CAMERA HAVING SOLID STATE DIAPHRAGM DEVICE

Ryoichi Suzuki, and Takashi Uchiyama, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1980, Ser. No. 171,477
Claims priority, application Japan, Jul. 27, 1979, 54-95659
Int. Cl.³ G03B *9/56*
U.S. Cl. 354—227.1 **3 Claims**





1. A camera having a solid state diaphragm device, including:

(a) a solid state diaphragm device, said device containing an electrochromic substance which, when supplied with current flowing in a prescribed direction, changes its light

transmittance, and upon cutting off of the current holds the resultant transmittance and being arranged in a position where a light beam from an object being photographed to film in the camera can be limited;

(b) light metering means, said means producing an electrical signal representing the object brightness;

(c) shutter means, said means being able to pass the light beam from the object for a predetermined time or dependent on said electrical signal;

(d) drive control circuit means, said means supplying said solid state diaphragm device with current flowing in a direction to reduce the light transmittance of said electrochromie substance only for a predetermined time prior to the start of the light beam passing operation of said shutter means, and upon detection of the termination of the light beam passing operation of said shutter means, supplying said solid state diaphragm device with current flowing in a direction to increase the light transmittance of said electrochromie substance; and

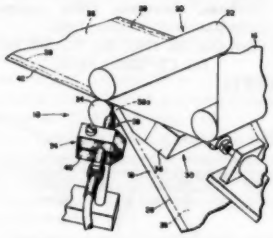
(e) power supply holding circuit means for operating in a manner so that after the start of current supply to an electrical circuit network of said camera by said means, this current supply to the electrical circuit network of the camera continues until the supplying of current in the direction to increase the light transmittance of said electrochromie substance by said drive control circuit is completed for the opening of the diaphragm device.

4,526,455

METHOD OF AND SYSTEM FOR CONTROLLING EDGE OF DISTRIBUTED PROCESSING FLUID

James J. Livingston, Waltham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 6, 1983, Ser. No. 529,211
Int. Cl.³ G03D *9/00*
U.S. Cl. 354—298 **16 Claims**



1. A method of supplying processing material to a photographic sheet so as to control material supplied thereto, comprising the steps of:

supplying processing material to the photographic sheet;

detecting a reference area on the sheet, said detecting step including transmitting at least a beam of measured energy to the reference area and generating a signal responsive to a change in a measured characteristic of the beam from the area which signal is representative of material being present or absent in the area; and,

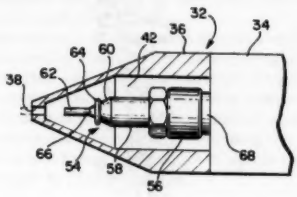
varying the output of processing material supplied to the sheet responsive to the generated signal so as to restore the reference area to its condition before the signal.

4,526,456

APPLICATOR FOR OXIDIZABLE FLUID

James J. Livingston, Waltham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1983, Ser. No. 529,105
Int. Cl.³ G03D *9/00*
U.S. Cl. 354—317 **7 Claims**



1. An applicator for intermittently dispensing processing fluid for distribution across a photographic film sheet, said applicator comprising:

a housing having an interior chamber for at least intermittently storing film processing fluid and an outlet opening extending from said chamber to the exterior of said housing for dispensing fluid from said chamber, said outlet opening having a given cross section and length as viewed in the direction of fluid flow through said opening; and,

a valve assembly displaceable between sealing and unsealing positions, said valve assembly including means for cleaning residual fluid through the length of said opening during the sealing thereof, said cleaning means including a tip member of said valve assembly closely fitted to the cross section of said opening and configured for displacement during sealing actuation through the length of said opening to the exterior end thereof so as to clean said opening of residual fluid, and said tip member being of sufficient length such that a portion thereof remains within said opening in blocking relation thereto when said member reaches said exterior end of said opening wherein the interior end of said opening includes a valve seat, and said valve member carries a compressible member mounted circumferentially of said tip member at the exterior end thereof for sealing engagement with said valve seat when said valve assembly is in its sealing position.

4,526,457

BOUYANT HANGER UNIT FOR DENTAL FILM CHIP

Richard B. Mease, Carpinteria, and Robert E. Burridge, Santa Barbara, both of Calif., assignors to M&D International Enterprises, Inc., Carpinteria, Calif.

Filed Aug. 29, 1983, Ser. No. 527,232
Int. Cl.³ G03D *13/10*
U.S. Cl. 354—345 **6 Claims**

1. A bouyant dental film chip hanger unit comprising:

an elongated rectangular plastic body having opposite flat faces and having a clip on the bottom end thereof and a handle portion on the upper end thereof;

a circular projection having a smaller diameter base on the face of said body below said handle portion;

a circular recess having an enlarged diameter bottom on the opposite face of said body on the same axis as said circular projection;

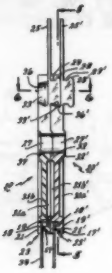
a circular hole provided through the central portion of said body;

a circular projecting rim on one face of said body about said circular hole;

a circular peripheral recess on the opposite face of said body about said circular hole; and

a slot extending longitudinally through the middle of said

body down from the top thereof through the handle portion, through the circular projection below said handle



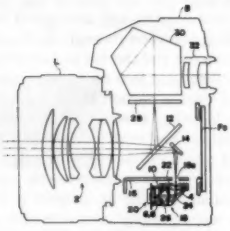
portion, and on down to the upper end of said circular hole.

4,526,458

FOCUS CONDITION DETECTING DEVICE FOR CAMERAS

Kunio Kawamura, Sakai; Hiromu Mukai, Kawachinagano, and Toshihiko Karasaki, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 30, 1984, Ser. No. 635,422
Claims priority, application Japan, Aug. 1, 1983, 58-141720
Int. Cl.³ G03B *3/00*
U.S. Cl. 354—406 **17 Claims**



1. A focus condition detecting device for a camera having an objective lens which forms an object image, said device comprising:

image sensor means which has first and second photocell arrays extending in the direction perpendicular to the main optical axis of said objective lens and arranged opposite to one another with respect to the main optical axis of said objective lens;

a transparent plate having first and second flat surfaces perpendicular to the main optical axis of said objective lens and arranged to face said first flat surface to said image sensor means;

a pair of re-imaging lenses formed on said transparent plate to re-image said object image as first and second images on said first and second photocell arrays respectively so that the distance between the corresponding points of said first and second images on said first and second photocell arrays varies with the focus condition of said objective lens, each said re-imaging lens having a convex surface on said first flat surface of said transparent plate to form a plano-convex lens;

a support member for supporting at least said transparent plate; and

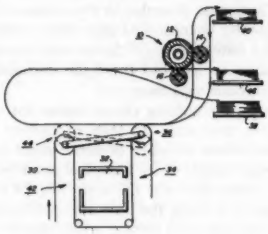
masking means having a pair of openings and blocking a part of light rays incident on said re-imaging lenses to form said first and second images, in a symmetrical manner with respect to the main optical axis of said objective lens, said masking means being sandwiched between said second flat surface of said transparent plate and said support member with said openings aligned with said re-imaging lenses.

4,526,459

MULTI-ROLL FUSING SYSTEM

Herbert L. Bresnick, Honeoye Falls, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1979, Ser. No. 107,967
Int. Cl.³ G03G *15/20*
U.S. Cl. 355—3 FU **4 Claims**



1. Fuser apparatus for use in a copying machine wherein toner images are formed on both sides of copy sheets, said fuser apparatus comprising:

a first roll mounted for rotation;

a second roll cooperating with said first roll to form a nip for totally fusing toner images on a first side of said copy sheet;

a third roll mounted for cooperation with said first roll to form a second nip for totally fusing toner images on asecond side of said copy sheets; and

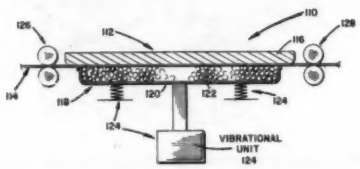
said first and second nips being arranged such that they receive said copy sheets from different directions.

4,526,460

DEVICE FOR PRESSURE FUSING IMAGES ON TO PAPER IN ELECTROSTATIC COPIES

Gordon G. Zeidman, Columbus, Ohio, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 25, 1983, Ser. No. 545,165
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 FU **9 Claims**



1. A pressure fixing device for a copying machine comprising:

a rigid backing plate for providing a rigid surface against which fusing pressure can be applied in order to pressure fuse an image onto a copy sheet;

a housing adjacent said rigid backing plate and forming a pressure fusing space with said rigid backing plate through which a copy sheet passes;

a plurality of a independent, freely movable rollers retained in said housing; and

vibrating means for vibrating said housing and causing said

rollers to contact the copy sheet and apply a fusing pressure to the copy sheet.

4,526,461

COPYING MACHINE CONTROL SYSTEM

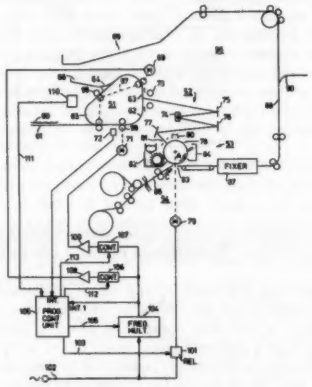
Bastiaan B. B. Eertink, Grubbenvorst, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

Filed Oct. 5, 1982, Ser. No. 432,835

Claims priority, application Netherlands, Oct. 8, 1981, 8104591

Int. Cl.³ G03G *15/00, 21/00*

U.S. Cl. 355—14 R **14 Claims**



1. A copying machine comprising:

an image receiving medium;

first transport means including a synchronous motor responsive to current having a substantially constant first frequency from an AC power source for transporting said receiving medium at a first speed proportional to the frequency of said source current;

second transport means including at least one other synchronous motor for transporting an original along a path for imaging the original;

an optical system for producing an image of an original in said path onto said receiving medium;

means for generating in response to an AC component from said source signal pulses having a second frequency always proportional to said first frequency; and

control means for supplying to a said other synchronous motor control pulses integrally related in frequency to said signal pulses so that said second transport means will transport an original along said path at a second speed proportional to said second frequency;

said optical system having at least one imaging ratio for each of which a corresponding relationship is establishable between said first frequency and said second frequency and consequently between said first speed and said second speed.

4,526,462

COLOR PRINTING CONTROL SYSTEM AND METHOD

Henry F. Hope; Stephen F. Hope, both of Huntingdon Valley, Pa., and David Fidelman, Roslyn Heights, N.Y., assignors to Hope Industries, Inc., Willow Grove, Pa.

Filed Mar. 22, 1983, Ser. No. 477,824

Int. Cl.³ G03B *27/73, 27/80*

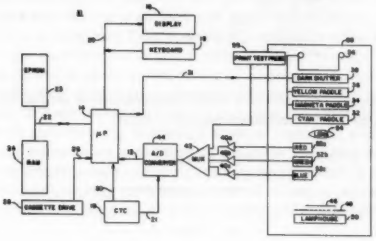
U.S. Cl. 355—38 **12 Claims**

1. A color printing control system having signal processing means for automatically performing setups of internal values for automatically self-correcting the control of color balance and color density in making color prints from color negatives comprising:

light transmitting means for transmitting light through each reference negative;

means for reading the light transmitted by each reference color negative and providing color print times in accordance with print time signals;

light source and light sensing means directly coupled to said signal processing means (1) for online reading of a normal reference print and producing a first set of signals related to the color densities of the reference print and (2) for online reading of prints made from normal, underexposed and overexposed reference negatives using initial internal values and producing a second set of signals each related to the respective color densities;



means for storing the first set of signals; and

said signal processing means including means for online comparing immediately upon the production of the second set of signals without human intervention the first set of signals with said second set of signals to determine adjusted internal values including adjusted print time signals to automatically correct and to adapt the internal values without human intervention if the first set of signals is not substantially equal to the second set of signals whereby the normal and underexposed and overexposed reference negatives produce prints with the same densities as the reference print and the adjusted internal values are maintained over a plurality of color prints.

4,526,463

APPARATUS FOR EXPOSING PHOTOSENSITIVE MEDIA

Robert V. Hickey; Duane B. Hickey, both of Corvallis, and Charles J. Goetzinger, Philomath, all of Oreg., assignors to CH_2M Hill, Inc., Corvallis, Oreg.

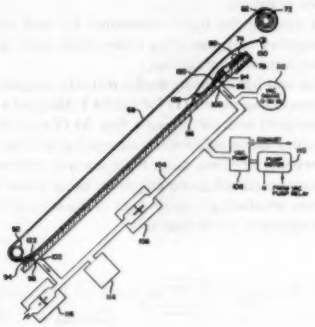
Filed Jul. 30, 1982, Ser. No. 403,681

Int. Cl.³ G03B *27/80, 27/20, 27/04*

U.S. Cl. 355—83 **21 Claims**

1. An apparatus for exposing photosensitive media to a source of light comprising light sensing means for receiving light from the source during exposure of the sensitized media, said light sensing means being positioned to receive light from the source which passes through one or more original sheets or samples thereof, but not through the photosensitive media overlying the originals, so that said light sensing means receives light of an intensity equal to the intensity of the light reaching the sensitized media drying the exposure of the me-

dia, said apparatus also including means for monitoring the light received by the sensing means and for automatically



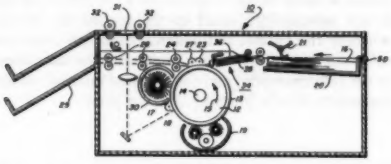
stopping the exposure of the photosensitive media upon sensing of a predetermined mount of light.

4,526,464

JAM CLEARANCE BAFFLE

William D. Milillo, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 9, 1983, Ser. No. 549,948
Int. Cl.[3] G03G *21/00*; B65H *7/00*
U.S. Cl. 355—3 SH **15 Claims**



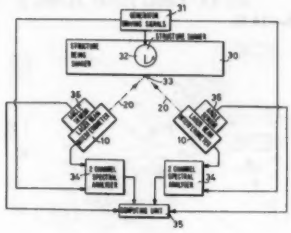
7. Reproducing apparatus comprising means to form a toner image on an imaging surface, means to fix a toner image on a copy sheet substrate, a copy sheet transport means to transport a copy sheet from a copy sheet supply to the imaging surface so that the lead edge of the copy sheet is in registration with the lead edge of the toner image on the image surface, means to transfer said toner image to the copy sheet, said copy sheet transport means further including means to transport said copy sheet with a transferred toner image thereon to a means for fixing said toner image, said copy sheet transport means comprising in part a first sheet guide member partially defining a portion of a sheet transport path, a second sheet guide member in opposed spaced guiding relationship to said first guide member and defining therebetween a portion of a sheet transport path, said second sheet guide member being pivotally mounted at its upstream end and having attached to its downstream end a U-shaped member which extends from said second sheet guide member through the defined sheet transport path and into the plane of said first sheet guide member defining an aperture therein enclosing a cross sectional slice of said transport path whereby when a sheet is transported through said portion of said sheet transport path it passes within the aperture formed by the U-shaped member and the second sheet guide member.

4,526,465

APPARATUS FOR DETECTING THE DISPLACEMENTS OF POINTS OF EXCITED STRUCTURES

Mario Corti, Segrate, and Fulvio Parmigiani, Cremona, both of Italy, assignors to CISE-Centro Informazioni Studi Esperienze S.p.A., Milan, Italy

Filed Mar. 9, 1982, Ser. No. 356,534
Claims priority, application Italy, Mar. 23, 1981, 20666 A/81
Int. Cl.[3] G01B *9/02*
U.S. Cl. 356—35.5 **8 Claims**



1. An apparatus for detecting the displacements of points of stressed structures, characterized in that it comprises, in combination:

coherent-light vibration-sensing means composed of at least one group of two laser-beam interferometers of the type to measure a vibration component along a respective axis focused at a common target point of the structure;

angle-sensing means rigidly connected to the interferometers of at least either group for determining the orientation of each said axis, and,

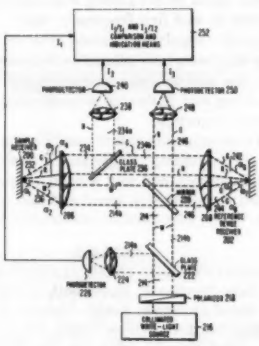
means for processing the measured vibration component data coming from said vibration-sensing means and the angular data coming from said angle-sensing means to compute the displacement of said target.

4,526,466

TECHNIQUE FOR VERIFYING GENUINENESS OF AUTHENTICATING DEVICE

John R. Sandercock, Affoltern, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 1, 1983, Ser. No. 528,450
Int. Cl.[3] G06K *7/00, 9/00*
U.S. Cl. 356—71 **10 Claims**



1. A testing method for verifying whether a sample purporting to be a given type of authenticating device for an item of sheet material is genuine, wherein a genuine device of said given type is comprised of a diffraction grating structure oper-

ating as a diffractive subtractive color filter responsive to the angle of incidence of continuous-spectrum polychromatic illuminating light having its E vector polarized substantially parallel to the grating lines of said structure, said filter deriving reflected colored light having a wavelength spectrum within said continuous spectrum that includes at least one peak occurring at a wavelength that varies as a predetermined substantially linear function of the angle of incidence of said polychromatic illuminating light, said method comprising the steps of:

(a) simultaneously illuminating said sample with a continuous spectrum polarized polychromatic first light beam over an angular range of angles of incidence between α_1 and α_2, in which α_1 and α_2 are two different oblique angles of incidence situated on the same given side of the normal to said sample as one another, said polarized polychromatic first light beam being polarized with its E vector oriented substantially parallel to the grating lines of a genuine sample, whereby a genuine sample reflects a polarized colored second light beam that has an angular range of angles of reflection between α_3 and α_4, in which α_3 and α_4 are respectively equal in value to α_1 and α_2 and are situated on the opposite side of the normal to said sample from α_1 and α_2;

(b) simultaneously illuminating a reference device known to be a genuine given type of authenticating device with said polarized colored second light beam over an angular range of angles of incidence between α_5 and α_6, in which α_5 and α_6 are respectively substantially equal in value to α_1 and α_2 and are situated on the same side of the normal to said reference device as one another, said polarized colored second light beam being polarized with its E vector oriented substantially parallel to the grating lines of said reference device, whereby said reference device reflects a polarized colored third light beam that has an angular range of angles of reflection between α_7 and α_8, in which α_7 and α_8 are respectively equal in value to α_1 and α_2 and are situated on the opposite side of the normal to said reference device from α_5 and α_6; and

(c) respectively comparing the intensity of said colored third light beam to the intensity of said polychromatic first light beam and to the intensity of said colored second light beam for indicating said sample to be genuine only in response to both the ratio of the intensity of said colored third light beam to the intensity of said polychromatic first light beam exceeding a first given threshold value and the ratio of the intensity of said colored third light beam to the intensity of said colored second light beam exceeding a second given threshold value.

4,526,467

APPARATUS AND METHODS FOR TESTING LENS STRUCTURE

Stephen D. Fantone, Saugus, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 19, 1982, Ser. No. 399,749
Int. Cl.³ G01B 9/00
U.S. Cl. 356—124 **19 Claims**

1. Apparatus for testing lens structures of the type that have a lens surface and are adapted to receive in one end thereof an optical fiber with the end thereof positoned at a predetermined location with respect to the focus of the lens surface and which include reference surfaces by which the mechanical axis of one such lens structure can be alinged with that of another to form a connector pair in which the first of the pair, serving as the input, operates to expand and collimate or nearly collimate a light beam upon emerging from the end of the fiber positioned therein and the other of the pair, serving as output, operates to receive the expanded, collimated light beam emerging from the input lens structure and focus it into the end of a fiber located in the output lens structure, said apparatus comprising:

a reflecting surface having the same nominal geometry as the end of an optical fiber to be used with such lens structures;

means for supporting a lens structure to be tested and for positioning said reflecting surface in the test lens structure at the nominal location an optical fiber end would occupy under actual use in a lens structure;

means for providing a collimated or nearly collimated beam of radiation of predetermined spectral content and having a diameter at least as least as large as that of the lens structure lens surface;

means for aligning said collimated beam of radiation to be concentric with and parallel to the mechanical axis of the test lens structure so that said beam of radiation covers the test lens structure lens surface and appears to the test lens structure to originate from a nominally perfect mating lens structure whereby said beam of radiation enters the test lens structure and is more or less perfectly focused thereby onto said reflecting surface from which it reflects to emerge from the test lens structure as a beam of radiation travelling oppositely to said entering collimated beam of radiation; and

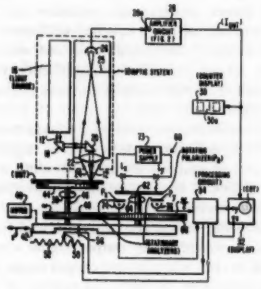
means for intercepting said beam of radiation emerging from the test lens structure and comparing its energy content with that of said entering collimated beam of radiation whereby the optical efficiency of the test lens structure is determined.

4,526,468

METHOD FOR DETERMINING THE PHASE OF PHASE TRANSFORMABLE LIGHT SCATTERING MATERIAL

Edgar F. Steigmeier, Hedingen, and Heinrich Auderset, Horgen, both of Switzerland, assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 30, 1983, Ser. No. 509,597
Int. Cl.³ G01N 21/01
U.S. Cl. 356—338 **10 Claims**



1. A method for determining the phase of a deposited material having a property of absorbing light to a given penetration depth, said material being capable of being deposited in either of two predetermined phases, comprising the steps of:

(a) depositing one of said two phases of said material on a surface;

(b) exposing one or more regions of said material to a beam of light of a selected wavelength;

(c) detecting light having an intensity greater than a threshold intensity scattered from the exposed material to provide an electrical signal proportional to the intensity of scattered light detected above said threshold intensity;

(d) applying the electrical signal to a visual display device to control the intensity of the display beam of the device; and

(e) varying said threshold intensity to thereby vary the

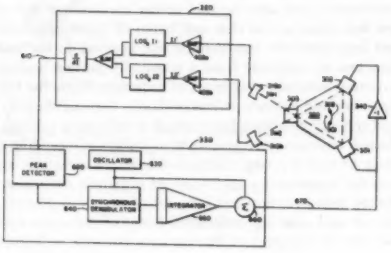
intensity of the display beam so as to provide the minimum intensity of display beam which yields a full display of the exposed material, wherein the value of the threshold intensity is a direct measure of the phase in which said material was deposited.

4,526,469

DISCRIMINANT APPARATUS FOR LASER GYROS

Werner H. Egli, Minneapolis, Minn.; Wah L. Lim, Anaheim, Calif., and Mark W. Weber, Elk River, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 1, 1982, Ser. No. 353,711
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **29 Claims**



1. In an angular rate sensor of the class wherein two waves propagate in opposite directions about a closed-loop path, each of said waves having an intensity associated therewith which includes intensity variations due to coupling of energy of each of said waves into the other along said closed-loop path, wherein the frequency of each of said waves is a function of the rate of rotation of said closed-loop path, and wherein said intensity variation of each of said waves has an amplitude and there being a phase relationship between said intensity variations of said waves, said intensity variations are of a frequency which is a function of the frequency difference between said waves, and wherein associated with said sensor is a lock-in rotation rate, related to said coupling of energy, below which said waves lock-in to substantially the save frequency, wherein the improvement comprises:

detecting means responsive to each of said waves for providing a first signal representative of the instantaneous intensity of one of said waves and providing a second signal representative of the instantaneous intensity of the other one of said waves; and

signal processing means responsive to said first and second signals for providing an output signal representative of said lock-in rate, wherein said output signal is a function of the instantaneous intensity variations of each of said waves and said phase relationship therebetween.

4,526,470

STRAY LIGHT MEASUREMENT AND COMPENSATION

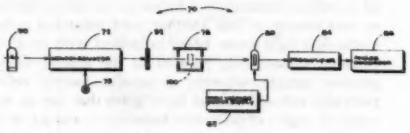
Wilbur I. Kaye, Corona del Mar, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 5, 1982, Ser. No. 355,281
Int. Cl.³ G01J *3/42*
U.S. Cl. 356—319 **13 Claims**

1. A method for determining stray light in a spectrophotometer at a first wavelength where the spectrophotometer has an optical path including a monochromator generating an output beam having a central wavelength and a predetermined slit function, a detector positioned to receive radiation from the monochromator, and means for substantially limiting detector response to radiation within an interval of significant detected radiant power, the interval of significant detected radiant power including the first wavelength, the method comprising the steps of:

(a) measuring a detected radiant power spectrum for a range of central wavelengths including at least the interval of significant detected radiant power,

(b) summing the product of the slit function and the detected radiant power spectrum over a first range of summation wavelengths including at least the interval of significant detected radiant power, but not including wavelengths within a predetermined interval around the first wavelength, and



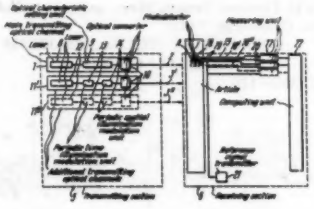
(c) scaling the result of step (b) by a constant to determine stray light, the constant having a value such that a summation of the products of the slit function and the detected radiant power spectrum over a second range of summation wavelengths including at least the interval of significant detected radiant power, when scaled by the constant, is equal to a detected radiant power at a second wavelength outside the interval of significant detected radiant power.

4,526,471

METHOD FOR SENSING SPATIAL COORDINATE OF ARTICLE POINT AND APPARATUS THEREFOR

Anatoly P. Bykov, ulitsa Stroitelnaya, 6, kv. 16; Anatoly A. Orlov, ulitsa Naberezhnaya Tsiolkovskogo, 22, kv. 82, both of Zhukovsky, Moskovskaya oblast; Dmitry D. Gribanov, ulitsa Chusovskaya, 11, korpus 6, kv. 35, Moscow; Vladimir P. Kulesh, ulitsa Stroitelnaya, 6, kv-29, Zhukovsky, Moskovskaya oblast; Sergei D. Fonov, Balashikhinsky raion, poselok Zarya, 180, kv. 52, Moskovskaya oblast; Vitaly V. Egorov, ulitsa Komsomolskaya, 7, kv. 49; Leonid M. Moskalik, ulitsa Molodezhnaya, 13, kv. 177, both of Zhukovsky, Moskovskaya oblast; Apollinary K. Martynov, 3-ya Frunzenskaya ulitsa, 3, kv. 40, Moscow, and Vladimir E. Ryadchikov, ulitsa Gagarina, 28, kv. 59, Zhukovsky, Moskovskaya oblast, all of U.S.S.R.

Filed Jun. 17, 1982, Ser. No. 389,470
Int. Cl.³ G01B *11/14*
U.S. Cl. 356—373 **19 Claims**



1. A method for sensing a spatial coordinate of a point of an article, comprising the following steps:

selecting a point on said article, whose coordinate is to be found;

producing a main coherent light field having several optical characteristics, one of which ensures one-to-one correspondence between the magnitude of said optical characteristics at any point in said field and the coordinate of said point at least along one coordinate axis;

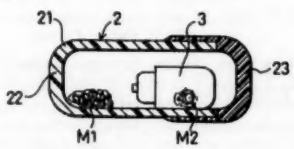
selecting a desired optical characteristic of said field;
transmitting said coherent light field to said point on said article;
measuring the magnitude of the selected optical characteristic of said main coherent light field at the point coinciding with the selected point on said article;
determining an approximate coordinate of the selected point on the article by using the obtained magnitude of said optical characteristic of said main coherent light field, thereby taking advantage of the one-to-one correspondence between the magnitude of said optical characteristic at any point in said field and the coordinate of said point;
producing at least one additional coherent light field which has no interaction with said main coherent light field and that possesses spatial periodic modulation of the illumination thereof;
transmitting said additional coherent light field to said article;
measuring the phase value of said additional coherent light field within a range of 2π radians at the point coinciding with the selected point on said article;
finding the number of the period of the spatial periodic modulation of illumination of said additional coherent light field, wherein the selected point on said article occurs at the moment of measurement, and, for this purpose, at first calculating the ratio of said approximate coordinate of the selected point on said article to the period of spatial modulation of illumination of the additional coherent light field;
subtracting said phase value expressed in radians from said ratio, the number of the period of spatial periodic modulation of illumination of said additional coherent light field being the integer of the quantity obtained by said subtraction;
determining a more accurate coordinate of the selected point of said article by adding up all the periods of spatial periodic modulation of illumination of said additional coherent light field up to the period having said found number, wherein the selected point of said article occurs at the moment of measurement, and said phase value is expressed in radians.

4,526,472

MIXING CAPSULE ASSEMBLY

Saul Zaltsman, Savyon, Israel, assignor to Silmet Ltd., Givatayim, Israel

Filed Aug. 16, 1984, Ser. No. 641,255
Claims priority, application Israel, Oct. 21, 1983, 70025
Int. Cl.[3] B65D *25/08*
U.S. Cl. 366—108 **13 Claims**



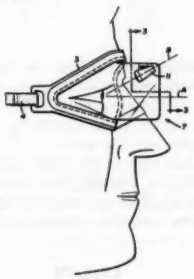
1. A mixing capsule assembly for mixing a plurality of materials by vibration, comprising: an outer capsule to receive one of the materials to be mixed; and an inner capsule to receive a second material to be mixed, and to be enclosed within said outer capsule; said inner capsule including two sections attachable together to enclose said second material and to prevent it from mixing with said first material; said two sections of the inner capsule being attachable together by at least one pair of complementary, frictionally-engaging surfaces configured such that when the inner capsule is impacted against one inner face of the of the outer capsule during the vibration of the capsule assembly, said complementary surfaces are moved away from each other to permit some of said second material to pass therebetween and to mix with said one material, and when the inner capsule is impacted against the opposite inner face of the outer capsule during the vibration of the capsule assembly, said complementary surfaces are moved back against each other to block the passage therebetween of said second material; said pair of complementary surfaces being constituted by the sides of a bore formed centrally in one of said sections, and the sides of a stem formed centrally in the other of said sections; the opposite ends of said two sections of the inner capsule being also in frictional engagement with each other.

4,526,473

HEADS UP SPORTS TIMER WITH ELECTRONIC TIME DISPLAY

Norman E. Zahn, III, 3180 N.W. 97th Way, Sunrise, Fla. 33321

Filed Nov. 21, 1983, Ser. No. 553,590
Int. Cl.[3] G04B *47/00*
U.S. Cl. 368—10 **15 Claims**



1. Sports timer with electronic timing function comprising:
at least one eyepiece comprising a time display,
electronic timer apparatus,
means for starting and clearing said electronic timer apparatus,
means for attachment of said sports timer to the head of an athlete such that said time display is visible to said athlete by turning his direction of view,
said electronic timer apparatus operatively engaging said time display to show the number of time units counted from the moment of starting said timer circuit,
means for supplying electric power to said electronic timer apparatus and said time display,
said eyepiece further comprising an objective lens,
said objective lens disposed generally in the line of sight between said athlete's eye and said time display.

4,526,474

DEVICE FOR STORING AND DISPENSING DRUG DOSES

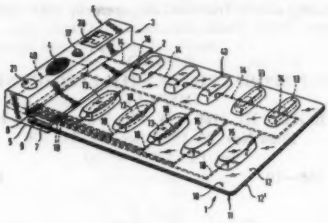
Udo Simon, Ziegelsteinstrasse 212, D-8500 Nürnberg 10, Fed. Rep. of Germany

Filed Jun. 19, 1984, Ser. No. 622,099
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3322920; Sep. 29, 1983, 3335301
Int. Cl.[3] G04B *47/00*
U.S. Cl. 368—10 **33 Claims**

1. A device for the storage and the periodical dispensing of a drug, comprising a drug container, an electronic timer system, associated with said drug container, and comprising a signal emitter being activated, at adjustable time intervals, and starting pulse input means connected with said signal emitter and being adapted for electric activation and for feeding of an electric starting pulse thereinto,
said drug dose body containing means comprising a first foil containing a series of blister pockets arranged in at least

one row and adapted for each of said pockets receiving a drug dose body therein, and at least one backing foil closing off said pockets and adapted for being ruptured in a rupturable foil area opposite each of said pockets, upon pressure being exercized in the area of a drug dose body on that side, of said first foil, from which said blister pockets project,

at least one electric pulse lead extending across each of said



rupturable areas of said at least one second foil and being connected with said pulse input means and being connected with said starting pulse input means of said timer system, said electric pulse lead being rupturable together with said rupturable foil area;

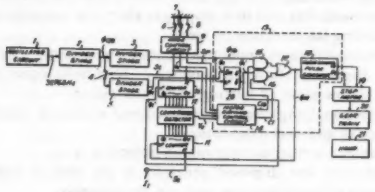
said signal emitter and electric pulse lead being so arranged as to introduce an electric pulse from said lead via said starting pulse input means into said signal emitter at least at the first time rupturing of said electric pulse lead.

4,526,475

ANALOG DISPLAY ELECTRONIC TIMEPIECE WITH MULTI-SPEED HAND MOVEMENT

Tatsuo Moriya, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jul. 5, 1983, Ser. No. 510,849
Claims priority, application Japan, Jul. 15, 1982, 57-123336
Int. Cl.³ G04F *5/00*
U.S. Cl. 368—157 **5 Claims**



1. In an analog timepiece having an oscillator circuit for generating a high frequency standard signal, a first divider network for dividing down said standard signal to a first lower frequency timekeeping signal, a step motor for driving at least one hand of said timepiece, said step motor being subject to damped oscillation after being driven, a driver circuit for receiving said timekeeping signals and outputting driving pulses to said step motor at a frequency corresponding to said timekeeping signal, the improvement therein comprising:

a second divider network receiving inputs derived from said standard signal and outputting a second lower frequency signal, said second frequency signal differing in frequency from said first timekeeping signal;

selection means for determining whether said first or said second lower frequency signal is input to said driver circuit to cause hand motion at a frequency corresponding thereto, said selection means being randomly activated to switch over operation between said lower frequencies;

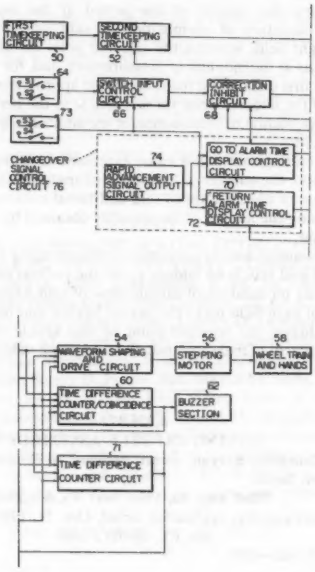
circuit means for providing a time interval between the last step motor driving pulse at one of said lower frequencies prior to switch over and the first step motor driving pulse at the other one of said lower frequencies after said switch over, said time interval at least equalling the period of said damped step motor oscillation regardless of the ramdom timing of activation of said selection means.

4,526,476

CORRECTION SYSTEM FOR HANDS DISPLAY TYPE OF ELECTRONIC TIMEPIECE

Yasuaki Nakayama, and Yasuo Kamiyama, both of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jul. 27, 1983, Ser. No. 517,875
Claims priority, application Japan, Jul. 30, 1982, 57-133202
Int. Cl.³ G04C *9/00*
U.S. Cl. 368—189 **5 Claims**



1. In a hands display electronic timepiece controllable to display a plurality of types of time information including at least first and second time information and provided with time display means comprising time indicating hands, circuit means for generating said first and second time information, externally operable means for producing signals selectively designating display of said first and second time information and circuit means responsive to said designating signals for producing signals acting to change the positions of said hands such as to indicate said designated time information, a correction system comprising:

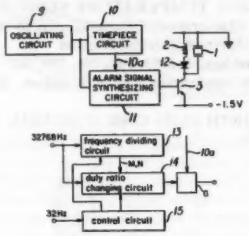
correction circuit means externally controllable for correcting at least one of said first and second time information; and

inhibit circuit means for rendering said correction circuit means effectively inoperative during a time interval which is synchronized with and of identical duration to a time interval during which changeover of said hands between positions indicating said first and second time information is in progress.

4,526,477
PIEZOELECTRIC BUZZER FOR WRIST WATCHES

Fumikazu Murakami, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 400,706, Jul. 22, 1982, abandoned. This application May 27, 1983, Ser. No. 498,694
Claims priority, application Japan, Jul. 23, 1981, 56-115489
Int. Cl.[3] G04C *21/16*
U.S. Cl. 368—250 17 Claims



1. A piezoelectric buzzer for wrist watches, comprising: a wrist watch module; a watch casing for holding said watch module; a piezoelectric element directly secured to one portion of said casing; and an electronic circuit, comprising a frequency dividing circuit for producing two output signals having a frequency ratio of 4:5, a duty ratio changing circuit for changing the duty ratios of the respective dividing circuit output signals, a control circuit for controlling said frequency dividing circuit and said duty ratio changing circuit, and a step-up driving circuit responsive to the dividing circuit output signals having duty ratios changed by the duty ratio changing circuit and having a step-up coil for developing a counter electromotive force for driving said piezoelectric element, said electronic circuit being incorporated into said watch module, and said dividing circuit output signals having duty ratios changed by the duty ratio changing circuit having two intervals the frequency of which alternately changes and being varied in duty ratio at respective intervals of time under control of the control circuit.

4,526,478
ELECTRONIC SOUND GENERATING CIRCUIT FOR GENERATION BELL TOLL

Shunichi Makuta, Saitama, Japan, assignor to Rhythm Watch Company Limited, Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 566,025
Claims priority, application Japan, Dec. 27, 1982, 57-229468
Int. Cl.[3] G04B *21/00*
U.S. Cl. 368—273 7 Claims

1. An electronic sound generating circuit for generating a bell toll and for an electronic device having standard signal generating means, comprising:

a first audio frequency signal generating circuit generating a first audio frequency signal;

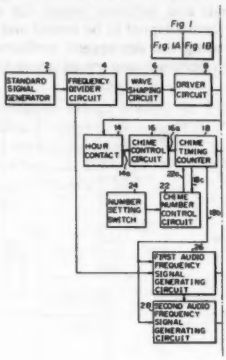
a second audio frequency signal gnerating circuit generating a second audio frequency signal having a frequency which differs from said first audio frequency signal from 1 to 10 Hz;

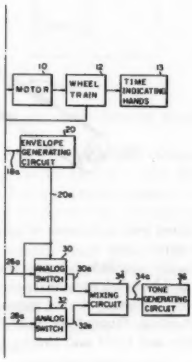
an envelope generating circuit producing an envelope signal;

a first analog switch receiving said envelope signal and said first audio frequency signal for modulating said envelope signal by the frequency of said first audio frequency signal;

a second analog switch receiving said envelope signal and said second audio frequency signal for modulating said envelope signal by the frequency of said second audio frequency signal;

a mixing circuit for mixing said respective signals from said first and second analog switches to provide a mixed signal whose power and pulse width vary periodically in accordance with the balance of the frequencies of said first and second audio frequency signals; and





a tone generating circuit generating said bell toll in response to said mixed signal.

4,526,479
ATHLETIC TIMER

Carl N. Harris, 2904 Augusta Dr., Durham, N.C. 27707

Continuation-in-part of Ser. No. 338,288, Jan. 11, 1982. This application Aug. 10, 1984, Ser. No. 639,490
Int. Cl.[3] G04B *37/00*
U.S. Cl. 368—284 2 Claims

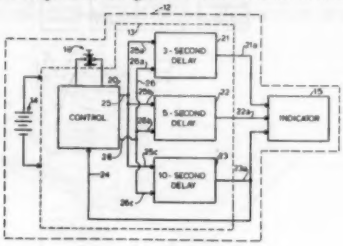
1. A hand-mountable timing device for use by a person for timing a selected athletic event requiring timing of penalty situations according to different lengths of time, comprising:

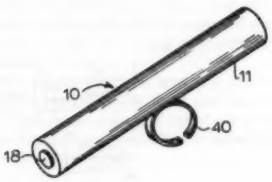
(a) a tubular housing sized for being gripped by the fingers and positioned on the hand with one end juxtapositioned the thumb of the user;

(b) means secured to said housing for releasably securing said housing to one hand of the said person performing the timing in a manner enabling said housing to be gripped by the fingers or to remain in place without being gripped and enclosed by the fingers of said hand so as to leave said hand and its fingers free for handling a ball or signaling while said housing remains secured to said hand and while simultaneously positioned with one end of said housing opposite said thumb of said hand;

(c) timing means enclosed by said housing, said timing means

having a power supply and single switch controllable timing means operative under single switch control to generate, start, stop and reset for restarting a series of time spaced signals and indicator means for expressing said signals in a form adapted to be sensed and understood by the person using the device and performing the timing without such person losing visual contact with the event





being timed and indicative of time allocated a given penalty situation; and

(d) a manually operable momentary switch mounted in said end of said housing proximate said thumb and operatively associated with said timing means, said switch by successive actuation thereof by said thumb being adapted to start, stop and reset said timing means.

4,526,480

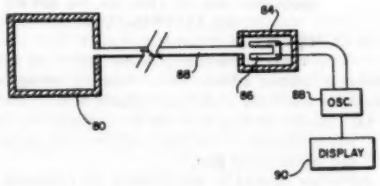
FLUID DENSITY TEMPERATURE MEASUREMENT APPARATUS AND METHOD

Roger W. Ward, Salt Lake City, Utah, assignor to Quartztronics, Inc., Salt Lake City, Utah

Division of Ser. No. 506,314, Jun. 21, 1983,. This application May 29, 1984, Ser. No. 614,686

Int. Cl.³ G01K *11/28*

U.S. Cl. 374—117 **5 Claims**



1. Gas density/temperature transducer apparatus comprising

a first generally rigid hollow housing,

a gas contained in the first housing,

a second generally rigid hollow housing,

a vibratory element mounted in the second housing,

an elongate tube coupling the first housing to the second housing to enable communication therebetween, wherein the volume of the tube is less than that of the first housing, and wherein the volume of the second housing is less than that of the first housing,

means for causing the element to resonate at a frequency f, said frequency varying with vibration in the density of gas in the second housing and thus the temperature of gas in the first housing, and

means for determining the frequency f.

4,526,481

ENGINE TEMPERATURE SENSOR

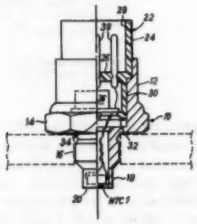
Jorgen Hansen, Ejaeverskov, Denmark, assignor to Elmwood Sensors Limited, North Shields, England

Filed Sep. 4, 1981, Ser. No. 299,282

Claims priority, application United Kingdom, Sep. 3, 1980, 8028372

Int. Cl.³ H01H *35/00;* **G08B** *21/00;* **G01K** *7/16*

U.S. Cl. 374—144 **4 Claims**



1. An engine temperature sensor comprising:

a. a housing outwardly shaped for mounting in an engine chamber wall with a sensing part thereof extending into the engine chamber;

b. a plurality of load terminals extending from said housing for electrical connection with respective temperature related engine functions whereby the electrical signal at each said terminal controls, in use, the operation of a corresponding engine function;

c. a temperature responsive element having a substantial temperature coefficient of resistance and being mounted in the sensing part of the housing;

d. electrical circuit board means mounted in said housing and having a first electrical connection which is connected to said temperature responsive elements and a plurality of second electrical connections which are connected to different load terminals;

e. a plurality of semiconductor switch means mounted on said electrical circuit board means and connected with different load terminals through said respective second connections for applying electrical signals thereto;

f. reference voltage means comprising a plurality of reference voltage networks mounted on the electrical circuit board means and providing a plurality of reference voltages, one for each said switch means;

g. integrated circuit means mounted on said electrical circuit board means and comprising a plurality of comparators, one for each said switch means, each comparator having a first input connected through said first electrical connection to said temperature responsive element, a second input connected to the reference voltage means to receive the reference voltage for the respective switch means and an output connected to the associated switch means such that the electrical signal at said output determines the switching state of the switching means, wherein the said reference voltages provided by the reference voltage means are selected so that the switch means change switching states at respective different levels in the range of resistance values of the temperature responsive element.

4,526,482

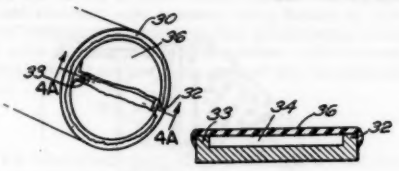
HYDRODYNAMIC BEARING SURFACE FOR HIGH LOADS AND LOW VISCOSITY LUBRICATING FLUIDS

Russell D. Ide, 28 Daniel Dr., Coventry, R.I. 02816

Filed Feb. 7, 1984, Ser. No. 577,691

Int. Cl.³ F16C *32/06*

U.S. Cl. 384—104 **4 Claims**



1. A hydrodynamic bearing surface comprising a plurality of bearing pads, each bearing pad consisting of a rectangular member with upper and lower surfaces and having peripheral ridges extending above the upper surface of the member, a compliant bearing element affixed to the ridges whereby the element will deflect under lubricant film pressure to form a substantially central depression for formation of a pressure pocket to carry high loads.

4,526,483

FLUID FOIL BEARING

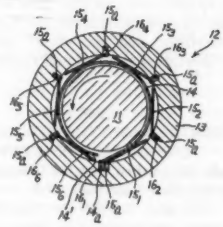
Yasuo Hishikawa, Kyoto; Hisashi Mitani, Osaka, and Masanao Ando, Kyoto, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Continuation of Ser. No. 390,374, Jun. 21, 1982,. This application Jun. 14, 1984, Ser. No. 619,640

Claims priority, application Japan, Jun. 29, 1981, 56-101960; Jun. 29, 1981, 56-101961; Jun. 29, 1981, 56-101962

Int. Cl.³ F16C *32/06*

U.S. Cl. 384—106 **5 Claims**



1. A fluid foil bearing comprising a housing in which a portion of a rotatable shaft is positioned, a foil bearing comprising a single sheet of resilient foil encircling said shaft portion and an anchoring pin fixed to one side edge of said foil for anchoring said foil to the interior surface of said housing and arranged in said housing as to surround substantially the whole circumference of said shaft portion with a minute space interposed between said foil bearing and said shaft portion, and supporting means disposed outside said foil bearing and in said housing for resiliently supporting said bearing at circumferentially spaced intervals so as to provide a predetermined preload on said shaft, wherein said supporting means comprises a plurality of generally flat, planar resilient foils arranged around said single bearing foil and each having one side edge secured to said housing interior surface at circumferentially spaced intervals and an opposite free edge contacting said housing interior surface to be supported thereby at a position spaced from said one side edge, with an intermediate portion of each said generally flat, planar foil extending between said opposite two edges and spaced apart from said housing interior surface for generally tangential contact with said single bearing foil at circumferentially spaced intervals with a predetermined contact pressure, thereby to provide a predetermined preload on said shaft.

4,526,484

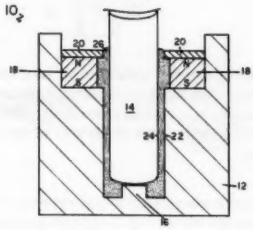
FERROFLUID THRUST AND RADIAL BEARING ASSEMBLY

Philip Stahl, Holliston, Mass.; Dudley D. Fuller, Lake Hill, N.Y., and Harry C. Rippel, Sharon Hill, Pa., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed Sep. 21, 1983, Ser. No. 534,415

Int. Cl.³ F16C *33/82*

U.S. Cl. 384—133 **15 Claims**



1. A ferrolubricant thrust and radial bearing assembly for a shaft which comprises:

(a) a housing characterized by a generally elongated cylindrical shaft-receiving cavity having a one and another end, and the housing having a radial bearing surface and having at the one end of the cavity a thrust bearing surface;

(b) a magnetically permeable shaft element in the shaft-receiving cavity, one end of the shaft supported by the thrust bearing surface and the other end of the shaft extending from the other end of the cavity, the surface of the shaft forming a close, noncontacting relationship with the radial bearing surfaces;

(c) ferrolubricant in the cavity, to provide lubrication to the thrust and radial bearing surfaces, and the ferrolubricant extending to the other end of the cavity and wherein the ferrolubricant has a viscosity of less than about 100 cps at 27° C. and a magnetic saturation of less than about 300 gauss; and

(d) a ferrolubricant seal apparatus means to form a ferrolubricant seal about the surface of the shaft at the other end of the elongated cavity, to prevent, during rotation of the shaft, the escape of ferrolubricant from the cavity and the entrapment of gases in the ferrolubricant.

4,526,485

SEALED ROLLING ELEMENT BEARING

Dietmar Frase, Dittelbrunn; Roland Eisenkolb, Schweinfurt; Heinz Kiener, Waigolshausen, and Güter Harant, Obereuerheim, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 15, 1979, Ser. No. 84,872

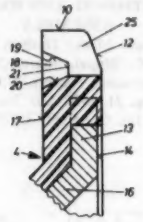
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 7833640[U]

Int. Cl.³ F16C *33/78*

U.S. Cl. 384—486 **4 Claims**

1. In a bearing having rolling elements positioned to roll between a pair of races in a chamber sealed by a sealing element affixed to one of the races; the improvement wherein the sealing element has a flexible periphery and is mounted to hold said flexible periphery in sealing contact with an annular surface of said one race, said flexible periphery having a portion that is weakened with respect to adjacent portions to enable

pressure within said chamber to be relieved by the flexible urging of said weakened portion away from said surface, said outer race having an annular groove therein, the outer periphery of said sealing element extending into said groove of said base and axially contacting the wall of said groove toward said



rolling element chamber under stress, said radial cut-out extending through the axial depth of said sealing elements and radially inward in said sealing element to a depth that does not extend to the inner diameter of the wall of said groove toward said chamber.

4,526,486

SERIAL PRINTER

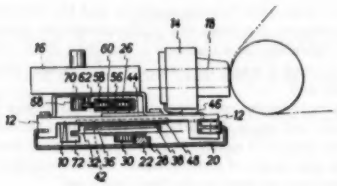
Hiroshi Kikuchi; Jiro Tanuma; Yoshinori Koshida, and Takashi Itaya, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1984, Ser. No. 576,863

Claims priority, application Japan, Feb. 7, 1983, 58-17472

Int. Cl.³ B41J *33/22, 19/20*

U.S. Cl. 400—185 **9 Claims**



1. A serial printer comprising a carriage carrying a printing head and moved in a horizontal direction, a motor mounted in the carriage having a rotor shaft extending in a vertical direction, a pinion directly connected to a first end of the rotor shaft of the motor, a rack engaged with the pinion, said rack being mounted parallel to a guide rail for movably supporting the carriage, ink ribbon feed means carried by the carriage for feeding an ink ribbon between the printing head and a printing sheet, said ink ribbon feed means including means to feed the ribbon in a single direction as the carriage moves in both forward and reverse directions, and gear means connected to a second end of the rotor shaft of the motor and engaging said ink ribbon feed means, whereby the carriage loaded with the printing head is moved along the rack by rotating the pinion engaged with the rack by rotation of the motor and said ink ribbon is fed by rotating the gear means engaged with the ink ribbon feed means by rotation of the same motor.

4,526,487

MULTICOLOR INK RIBBON CASSETTE

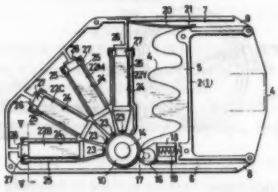
Yoshiaki Ikeda, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1983, Ser. No. 463,161

Claims priority, application Japan, Feb. 4, 1982, 57-16726

Int. Cl.³ B41J *31/14, 32/02*

U.S. Cl. 400—201 **9 Claims**



1. A multicolor ink ribbon cassette comprising: a cassette case having opposed top and bottom major sides; means defining an ink ribbon path for guiding the movement of an ink ribbon through the cassette case; a multicolour ink ribbon having plural lengthwise extending stripes of colored ink, the ink ribbon having at least a major portion thereof stored within the cassette case and being disposed for lengthwise movement along the ink ribbon path; ink transfer means disposed within the cassette case along the ink ribbon path for separately transferring colored inks supplied thereto to correspondingly colored ones of the ink ribbon stripes; and plural ink cartridges each containing a supply of a different one of the colored inks for supplying the same to the ink transfer means, the plural ink cartridges being disposed in angularly spaced relation about the ink transfer means with their center lines lying in a common plane, two of the ink cartridges being similar in shape and having an ink-supplying wick extending outwardly from one end thereof at a distance vertically spaced from the center line of the ink cartridge and the two similarly shaped ink cartridges being arranged in the cassette case in upside down relation with respect to each other so that their wicks contact the ink transfer means on opposite sides of the common plane at equal distances therefrom, and the plural ink cartridges being mounted for individual removal and replacement.

4,526,488

INK RIBBON CASSETTE PROVIDED WITH AN IMPREGNATION DEVICE

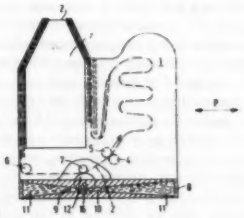
Joachim Krull, Siegen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1983, Ser. No. 539,873

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1982, 3237122

Int. Cl.³ B41J *31/16, 32/02*

U.S. Cl. 400—202.4 **7 Claims**



1. An ink ribbon cassette for use with a printer having a carriage, said cassette being provided with an ink impregnation device for the ink ribbon, said cassette being mountable on the carriage of the printer, said cassette having a container which

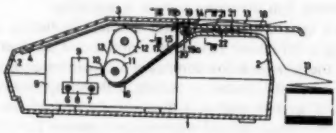
contains liquid ink, said ink being supplied to a wettable roller over which the ink ribbon is guided, said wettable roller being rotated by the movement of the ink ribbon, said container having a protruding threshold, an extraction tube having one end which opens into said threshold, another end of said extraction tube being located adjacent to said wettable roller so that ink flows from the extraction tube onto the wettable roller, the liquid ink having an upper surface which normally lies below said threshold, said container being formed by two cavities of narrowing cross-sections, said cavities being joined to each other at the points of their smallest cross sectional areas, said points of smallest cross-sectional area forming said threshold.

4,526,489

PRINTER HOUSING WITH WEB TENSIONING MEANS

Kenichi Tsumuraya, and Toshiaki Furuya, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 578,864
Claims priority, application Japan, Feb. 10, 1983, 58-21175
Int. Cl.³ B41J *29/02*
U.S. Cl. 400—693 **9 Claims**



1. A printer housing comprising: a case body which is partly open at its top and which is dimensioned to accommodate therein a printer mechanism having a printing head; a cover for said case body; said case body having a top surface which is spaced below one end of said cover, said top surface and said one end of said cover thereby defining therebetween an opening through which a paper to be printed is moved into said case body for printing by the printing head, and out of said case body after printing; a paper shelf lying over said top surface of said case body and pivotably supported at one end for pivotal movement away from said top surface, said one end of said paper shelf being located in the vicinity of said opening and spaced slightly apart from said top surface and said cover; said top surface having at least one projection extending transversely of said paper; and said paper shelf having a lower surface facing said top surface and formed with at least one projection extending transversely of said paper and spaced apart from said projection on said top surface longitudinally of said paper, said projection of said paper shelf having a lower extremity lying at a level below the upper extremity of said projection of said top surface.

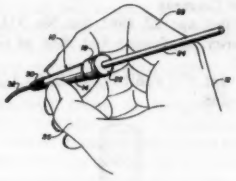
4,526,490

DISPENSER FOR FLOWABLE MATERIAL

Richard E. Welsh, Milford, Del., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Aug. 29, 1983, Ser. No. 527,447
Int. Cl.³ B43M *11/06*
U.S. Cl. 401—183 **4 Claims**

1. A dispenser adapted for manual manipulation comprising in combination, a container which is circular in cross-section having flexible walls adapted to be squeezed toward each other to effect discharge of material and having a filling opening at one end and a discharge opening at the opposite end, a flanged plug-like first closure member having an elongated handle member of substantially smaller diameter than said container extending axially from one end of said container and having a length approximately twice that of said container, said first closure member being separably connected tightly to the filling opening of said container and said handle being adapted to facilitate manually holding the container between the thumb and forefinger of a user similarly to the manner of holding a pen when writing to guide the dispenser when effecting discharge of contents of said container at desired locations, the discharge opening being adapted to be connected selectively to



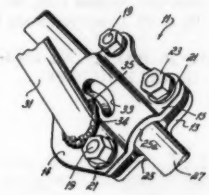
a second closure member and a tubular discharge spout, and the filling end of said container having an enlarged collar to facilitate effecting a leakproof connection of said filling end with said flanged first closure member.

4,526,491

BICYCLE HANDLEBAR STEM ASSEMBLY

Dennis P. Pawsat, Maysville, Ky., assignor to Wald Manufacturing Company, Inc., Maysville, Ky.

Filed Jan. 21, 1982, Ser. No. 341,314
Int. Cl.³ B62K *21/22*
U.S. Cl. 403—24 **28 Claims**



1. A handlebar stem assembly for securing the handlebar of a bicycle to the frame thereof comprising a top plate and a bottom plate each formed to receive said handlebar, said top and bottom plates each having a top surface and a bottom surface, means for connecting said top and bottom plates together, stem means connected by a welded connection at one end to said bottom plate and adapted to be connected at the other end to said bicycle frame, means for reducing stress concentration in said bottom plate, said stress concentration reducing means comprising an aperture formed in said bottom plate adjacent said welded connection with said stem means, said handlebar being adapted to be secured between said plates on one side of said bottom plate offset from said welded connection, said one side of said bottom plate having a side edge extending between said top and bottom surface of said bottom plate, and said aperture being located between said welded connection and said side edge on said one side of said bottom plate and being spaced from said side edge.

4,526,492
ANCHORING ELEMENT FOR FIBROUS COMPOSITE MATERIALS

Lothar Preis, Bergisch-Gladbach; Jürgen Hoffmann, Cologne, and Kurt Rompf, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 371,028

Claims priority, application Fed. Rep. of Germany, May 9, 1981, 3118492

Int. Cl.³ F16B *11/00*; B25G *3/24*

U.S. Cl. 403—268 **8 Claims**

1. In an anchor for a rod of fibrous composite material including a sleeve having a bore receptive of said rod, the bore being profiled substantially perpendicularly to the axis of the received rod and an element for widening the received end of the rod, the improvement wherein the axial cross section of the bore is circular and greater than and spaced from the non-widened cross section of the rod and the bore as defined by the profile is overall generally cylindrical and substantially constant along the length of the bore and wherein the widening element has a substantially constant cross section along the length thereof and further comprising sealing compound completely filling the space in the bore between the rod, the widening element and the sleeve.

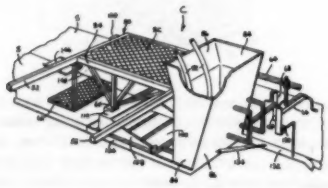
4,526,493
SLIP-FORMING MACHINE AND PROCESS FOR LAYING CONCRETE MIX ADJACENT TO PLASTIC CONCRETE MIX

Howard H. Hall, Ladue, and Norman Goff, St. Louis, both of Mo., assignors to H. H. H. Concrete Paving Co., St. Louis, Mo.

Filed May 26, 1983, Ser. No. 498,460

Int. Cl.³ E01C *19/48*

U.S. Cl. 404—105 **25 Claims**



1. A paving process comprising: extruding concrete mix onto a surface to provide a first slab having a generally flat upper surface and side edges; thereafter extruding a second extending slab immediately adjacent to the first slab while the concrete mix of the first slab is still plastic, the second slab having a generally flat upper surface which is flush with the upper surface of the first slab and side edges, one side edge of the second slab being directly against and abutting a side edge of the first slab, the second slab being extruded through a slip form that is moved along the side of the first slab and has spaced apart first and second side walls and a top wall extended between the side walls, the first side wall of the slip form being urged firmly against the edge of the first slab as the slip form moves along the first slab and extrudes concrete mix; and allowing the concrete mix of the two slabs to harden.

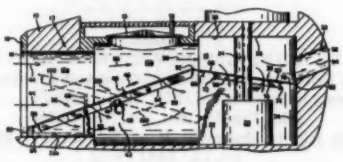
4,526,494
PENSTOCK FISH DIVERSION SYSTEM

George J. Eicher, Portland, Oreg., assignor to Eicher Associates, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 312,189, Oct. 16, 1981,. This application Apr. 19, 1982, Ser. No. 369,464

Int. Cl.³ E02B *8/08*

U.S. Cl. 405—83 **15 Claims**



1. A penstock fish diversion system comprising:

a penstock spaced below a water surface, including walls defining a cul-de-sac having an entrance at an upstream end of the penstock for admitting a downstream flow of water at a first velocity, a ceiling, a floor, opposite sidewalls and an end wall at a downstream end of the penstock, for containing said water under pressure for driving a turbine;

a turbine intake in the penstock;

screening means extending from side to side in said penstock above the turbine intake for diverting fish into an upper portion of the penstock; and

bypass means in the penstock defining an enclosed passageway spaced below the surface of the water and having an intake opening above the screening means for discharging, under pressure greater than atmospheric pressure, a portion of the water and any fish therein from the upper portion of the penstock to bypass said fish around the turbine intake.

4,526,495
MINE ROOF SUPPORT ASSEMBLY

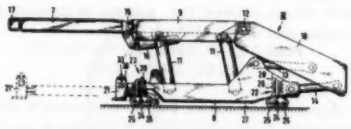
Kunibert Becker, Werl; Burckhardt Elsner, Lünen, and Rüdiger Kirchbrücher, Dortmund-Brackel, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lünen, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 540,019

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238256

Int. Cl.³ E21C *29/00*; E21D *15/52, 23/04*

U.S. Cl. 405—299 **20 Claims**



1. A mine roof support assembly comprising at least two mine roof support units positioned side-by-side and coupled to a common transverse beam, each of the roof support units having a floor sill, and each of the floor sills including floor-engageable roller means, wherein each of the roller means includes a steerable roller device, each steerable roller device being pivotally mounted on the associated floor sill about a pivot axis which lies at right-angles to the plane of that floor sill, and wherein the steerable roller devices are coupled to-

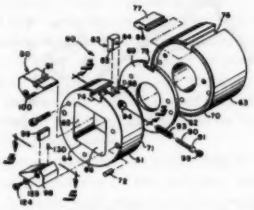
gether and are steerable by a common steering device which enables the support assembly to negotiate right-angled turns.

4,526,496

TAPERED THREAD CUTTING MACHINE

Anton M. Kies, Oisterwijk, Netherlands, and Mark V. Samas, Euclid, Ohio, assignors to Erico Products, Inc., Cleveland, Ohio

Filed Jun. 25, 1982, Ser. No. 391,681
Int. Cl.³ B23G *5/08*
U.S. Cl. 408—179 **27 Claims**



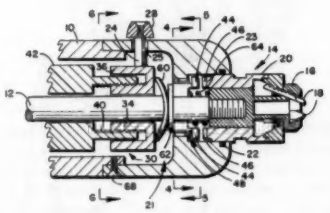
1. A tapered thread cutter for bar stock, tubing and the like comprising a rotary head block including a polygonally shaped recess supporting chaser holders on respective interior facets thereof for opening and closing movement, each chaser holder including on its interior a V-shape groove angularly disposed with respect to the rotational axis of said head block and having the walls thereof at right angles to each other, a stop at one end of said groove, and a clamp near the other end operative to hold a chaser in said groove, said chaser being an essentially rectangular block having substantially parallel faces with right angle sides in juxtaposition with the sides of said V-shape groove.

4,526,497

AUTOMATIC JAW CONTROL FOR REVERSIBLE POWER TOOL

Jim J. Hatfield, 2723 Spreckles La., Redondo Beach, Calif. 90278

Filed Mar. 15, 1982, Ser. No. 358,030
Int. Cl.³ B23B *31/24*
U.S. Cl. 408—240 **6 Claims**



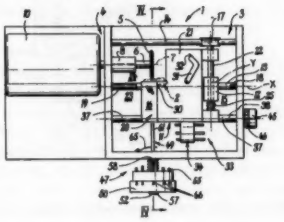
1. In a reversible drill having a rotary drive shaft carried by a drill housing and having a chuck engageable for rotation with said drive shaft and formed with a jaw guide, chuck jaws constrained by said jaw guide for radial advancement and retraction relative to the axis of said drive shaft, chuck jaw reciprocating means journaled relative to said jaw guide, and coupled to said chuck jaws to selectively advance and retract said chuck jaws when said chuck jaw reciprocating means and said jaw guide are subjected to relative rotation in opposite directions, and manually actuatable clutch means for engaging and disengaging said chuck jaw reciprocating means relative to said drill housing to respectively prevent and allow relative rotation between said jaw guide and said chuck jaw reciprocating means, the improvement wherein said clutch means includes a clutch actuator mounted for movement relative to said drill housing, and including a bearing collar disposed coaxially about said drive shaft and riding on a spiral track secured relative to said drill housing and a radial lever arm operated from externally of said drill housing and connected to said bearing collar, clutch interface means for engaging said drill housing to said chuck jaw reciprocating means and including first and second sets of opposing teeth disposed about a common axis and about said drive shaft in facing relationship, longitudinally reciprocal means for bringing said first and second sets of teeth into and out of engagement, means for immobilizing said first set of teeth from rotation relative to said drill housing, means coupling said second set of teeth to rotate with said chuck jaw reciprocating means, biasing means urging said first and second sets of teeth apart and urging said first set of teeth to drive bearing collar toward one end of said spiral track, coupling means for moving said clutch interface means into engagement at a mechanical advantage in response to movement of said clutch actuator, wherein said lever means is coupled to said bearing collar and operable from externally of said drill housing to totate said bearing collar and overcome said biasing means to advance said bearing collar toward the opposite end of said spiral track, thereby forcing said first and second sets of teeth into mutual interengagement.

4,526,498

KEY FORMING MACHINE

Raymond Fieldhouse, Launceston, Australia, assignor to Lloyd Matheson, Inc., Charlestown, N.H.

Filed Jul. 20, 1982, Ser. No. 400,230
Claims priority, application Australia, Jul. 30, 1981, PE9999
Int. Cl.³ B23C *3/35*
U.S. Cl. 409—82 **7 Claims**



1. A key forming machine including: a machine frame; key forming means mounted on the machine frame and operable to form bittings of preselected location and depth into a key blank presented thereto to form a key; a carriage assembly adapted to carry a key blank and mounted on the machine frame for linear movement relative thereto for presentation of the key blank to the key forming means; and, a first indexing mechanism operable to move the carriage assembly, for presentation of a carried key blank to the key forming means to first indexed positions corresponding to one of either preselected bitting locations or bitting depths, the first indexing mechanism including an interengageable first cam element and first follower element, the first cam element having a cam body mounted for rotation about a cam axis and a series of separate indexing posts rigidly carried by the cam body so as to extend in spaced apart relation about and parallel to the cam axis, the indexing posts being of equal effective length and arranged axially offset relative to each other along the cam axis, each indexing post having opposed end faces defining a pair of discrete land portions representative of a respective one first indexed position of the carriage assembly, and the first follower element including a pair of first cam followers mounted spaced apart from each other and radially offset from the cam axis with each first cam

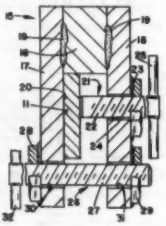
follower having a cam face, the first follower element being located adjacent the first cam element during machine use so that the first cam element can be rotated about the cam axis to bring each indexing post in turn into direct camming engagement with both of the first cam followers, continued rotation of the first cam element upon camming engagement between any one indexing post and the first cam followers causing the first cam followers and first cam element to move linearly relative to each other and parallel to the cam axis until the one indexing post extends between, and each of the end faces thereof abuts a respective one of, the cam faces of the first cam followers to thereby positively linearly locate the first cam element and first follower element relative to each other, the relative linear movement between the first cam followers and first cam element linearly moving the carriage assembly to the first indexed position represented by the one indexing post to thereby present the carried key blank to the key forming means for forming a bitting at the corresponding bitting location or bitting depth.

4,526,499

RAIL LOCK

Vincent P. Bonolis, 7841 St. Claire La., Baltimore, Md. 21222

Filed Sep. 13, 1983, Ser. No. 531,719
Int. Cl.³ B61D *3/16*; B61K *7/16*
U.S. Cl. 410—31 **5 Claims**



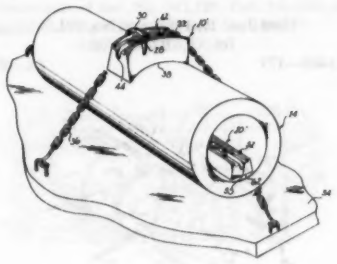
1. A rail lock for meat suspended from a trolley means slidably mounted on an overhead rail, wherein the rail has a top edge and a bottom edge, comprising a member having a central section disposed above the rail and further having a pair of depending legs carried by the central section, the legs straddling the rail and extending therebelow, whereby the inner surface of one of the legs is substantially flush against a side of the rail, first clamping means carried by the other leg and engaging the other side of the rail, the first clamping means including a first clamping element accessible from the outer face of the other leg, whereby the first clamping means exerts a force tending to move the legs apart, and second clamping means carried by the legs below the rail and exerting a counterforce tending to bring the legs together, thereby rigidly retaining the rail lock on the rail, the second clamping means including a second clamping element accessible from the outer face of the one leg, whereby the first and second clamping elements are on opposite sides of the rail lock, thereby precluding any interference between the trolley means and the first and second clamping means, and wherein the second clamping means further includes a bolt disposed just below the bottom edge of the rail, the arrangement being such that when the trolley means bangs against the rail lock, the rail lock will not pivot sufficiently to allow the trolley means to ride up over the rail lock.

4,526,500

PROTECTIVE MEMBER FOR METAL COILS

Clayton D. Patrick, 1608 E. John St., Knox, Ind. 46534

Filed Dec. 27, 1982, Ser. No. 453,347
Int. Cl.³ B60P *7/12*
U.S. Cl. 410—48 **6 Claims**



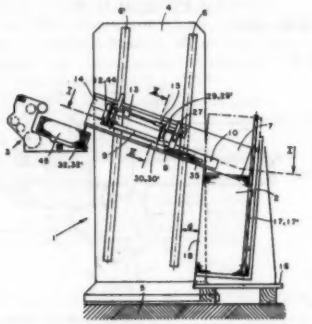
1. A protective device for use in securing a metal coil to a base by means of a flexible elongated securement member, comprising a hard plastic member having a coil contacting surface and an opposed grooved surface which receives said securement member, said securement member being connected at its ends to said base and extending through said groove, and a releasable retainer carried by said protective member for retaining said securement member in said groove.

4,526,501

SHEET PILE REPLENISHMENT APPARATUS

Martin Blumle, Gullesheim, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. Kg, Neuwied, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,454
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306575
Int. Cl.³ B65H *29/34*
U.S. Cl. 414—32 **6 Claims**



1. A pile replenishment apparatus for lifting a sub-pile of sheets from a supply pile of sheets at an unstacking station, conveying and then depositing the sub-pile at a restacking station on a pile of sheets on a feed pile plate of a sheet feeder of a processing machine, such as an envelope or bag machine, said apparatus comprising:

(a) a table adapted to receive said sub-pile, said table being of comb-like construction wherein all the teeth thereof and hence the gaps therebetween are adjustable with respect

to width, except that the middle pair of teeth are fixed defining a fixed gap therebetween;

(b) a carriage on which said table is mounted which horizontally reciprocates said table between said unstacking and restacking stations, said carriage also being adapted to raise and lower said table;

(c) a drivable separating roller provided at said table unstacking edge adapted to be introduced into said supply pile of sheets, said separating roller being adjustable on the unstacking side of said table at an angle relative to said supply pile of sheets so as to effectively extend or reduce the length of said table on the unstacking side according to the inclination of said separating roller;

(d) at least one clamp having two vertically superposed jaws for retaining the sub-pile during unstacking and conveying, said clamp being disposed above said table and adapted to be horizontally and vertically movable with respect thereto, the bottom jaw of said clamp adapted to be received in said fixed gap defined by the middle pair of fixed teeth of said table;

(e) aligning pins associated with said table for accurate alignment and positioning of said sub-pile, said aligning pins being adjustable with respect to their spacing and in the direction of conveyance of said sub-pile, adapted to be raised and lowered in the direction of the height of said sub-pile, and including centering means; and

(f) pile holders on said feed pile plate which include centering means engageable with the centering means of said aligning pins during restacking.

4,526,502

SLIDE FORK POSITIONING APPARATUS

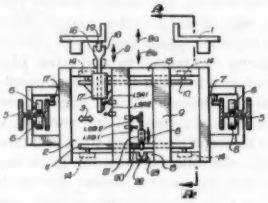
Yoshio Mitani, Gifu, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed May 21, 1982, Ser. No. 380,812

Claims priority, application Japan, May 24, 1981, 56-79009

Int. Cl.³ B65G *1/06*

U.S. Cl. 414—282 **10 Claims**



1. An apparatus for positioning a slide fork provided on a stacker crane which is movable in the horizontal direction and in the vertical direction along a load rack, characterized in that said slide fork is made freely movable relative to said stacker crane in the horizontal direction and includes a first engaging member which is freely projectable in the direction of said load rack, wherein a second engaging member which can engage with the first engaging member to lock the slide fork to a definite position with respect to the load rack is provided on the side of said load rack and wherein the apparatus further includes a centering means for positioning and locking said slide fork to a definite position relative to said stacker crane, wherein the centering means is actuated during horizontal movement of the stacker crane along the load rack and is released when the stacker crane arrives at a desired position and wherein the first engaging member is then projected toward the second engaging member to position and lock the slide fork with respect to the load rack.

4,526,503

SUPPORT STRUCTURE FOR CHECKING AND REPAIRING HEAVY ROTATABLE OBJECTS

Yutaka Muraguchi, Nougata, Japan, assignor to Hoko Sangyo Co., Ltd., Fukuoka, Japan

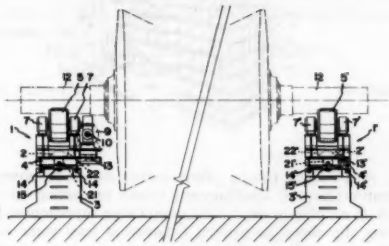
Division of Ser. No. 296,736, Aug. 27, 1981, Pat. No. 4,452,558. This application Jan. 26, 1984, Ser. No. 573,906

Claims priority, application Japan, Mar. 5, 1980, 55-28434[U]

The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.

Int. Cl.³ F16M *11/14;* **B23B** *5/20*

U.S. Cl. 414—433 **7 Claims**



1. A support device for checking and repairing a heavy rotatable object such as a large turbine rotor comprising a pair of self-aligning support structures for rotatably supporting both ends of a shaft of said heavy rotatable object, said support structures being disposed at a distance from each other to provide a space therebetween for accommodating said heavy rotatable object, each of said self-aligning support structures comprising:

(i) a base frame set on a floor,

(ii) a roller support base mounted on said base frame;

(iii) a pair of parallel-spaced-apart support rollers mounted on said roller support base and rotatably supporting one end of the shaft of said heavy rotatable object, each of said pair of parallel-space-apart support rollers having its own shaft rotatable about generally horizontal axes,

(iv) a single partially spherical support mechanism interposed between said base frame and each of said roller support bases so as to allow said roller support base to tilt in any radial direction on said base frame, each of said partially spherical support mechanisms comprising a support member having a partially spherical surface, each of said partially spherical support mechanisms having a generally vertical axis passing generally through the center of the respective partially spherical surface with an extension of said vertical axis symmetrically bisecting the distance between the horizontal axes of the respective pair of said parallel-spaced-apart rollers, and

(v) a drive mechanism with a reduction means operably coupled with said support rollers on one of said roller support bases and operable to rotate said heavy rotatable object at a low speed,

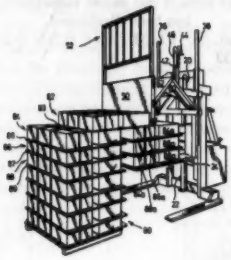
whereby when both ends of said shaft of said heavy rotatable object are placed on said support rollers of said respective support structures, the axes of each of said pair of support roller shafts are automatically aligned in both horizontal and vertical directions to be parallel with the shaft of said heavy rotatable object even when the shaft of said heavy rotatable object is deflected due to its own weight, thus assuring sufficient and uniform support of said heavy rotatable object by said support rollers of said support structure.

4,526,504

PUSH-PULL DE-TIERING SYSTEM

Gordon E. Hovey, 1333 Bloor St. E., Apt. 805, Mississauga, Ontario, Canada (L4Y 3T6)

Filed Jun. 23, 1983, Ser. No. 507,001
Int. Cl.[3] B60P *1/02*
U.S. Cl. 414—661 6 Claims



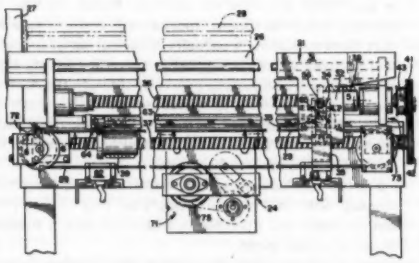
1. A lift truck having prime mover means to power the operation thereof; load support means projecting from the truck to receive in use a load comprising superimposed tiers having slip sheets interposed between at least some of said tiers; substantially vertical mast means; carriage means displaceably secured to the mast means for up and down displacement thereon having said load support means secured thereto; main hoisting means for selectively positioning said load support means at a desired height for the addition and removal of load therefrom; push-pull load displacer means including slip sheet gripper means mounted on said truck, above said load support means for displacement, when in a retracted condition, vertically behind said tiers, secondary hoisting means for positioning said push-pull means at a predetermined height relative to a selected said tier of said load, and actuating means for operating said push-pull means in load displacing relation.

4,526,505

FAST RETRACT FEED

Timothy G. Mally, Oregon, and Bruce W. Stengel, De Forest, both of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Feb. 3, 1983, Ser. No. 463,561
Int. Cl.[3] B65G *25/08*
U.S. Cl. 414—750 17 Claims



1. An apparatus for precisely feeding an elongated product through a selected feeding stroke, comprising:

a transport assembly slidingly mounted on the apparatus for longitudinal movement along a transport path for moving an elongated product in a longitudinal direction, said transport assembly having an engagement block;

a feed assembly having a drive member and a driven member that traverses a drive path along the drive member, said drive path having a feed-initiating position and a feed-completed position, said driven member having a lug that is structured for engagement with said engagement block of the transport assembly;

an actuator assembly for engaging a portion of the feed assembly, said actuator assembly effecting engagement or disengagement of the feed assembly with respect to the transport assembly at the feed-initiating position and feed-completed position of the feed assembly, said actuator assembly including shifter means for shifting the feed assembly between a feed orientation and a return orientation of the driven member; and

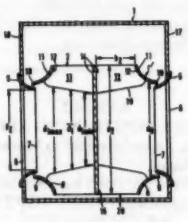
a retract drive assembly for rapidly moving said transport assembly along said transport path when said transport assembly is disengaged from said feed assembly.

4,526,506

RADIAL FAN WITH BACKWARDLY CURVING BLADES

Friedrich Köger, Neuenstein, and Udo Haas, Hardheim, both of Fed. Rep. of Germany, assignors to Wilhelm Gebhardt GmbH, Waldenburg, Fed. Rep. of Germany

Filed Dec. 27, 1983, Ser. No. 565,656
Claims priority, application European Pat. Off., Dec. 29, 1982, 82112081.3
Int. Cl.[3] F01D *3/02*; F04D *29/38*
U.S. Cl. 415—98 23 Claims



1. A radial fan comprising a spiral housing, a radial impeller fitted in said housing for turning motion therein, a support plate on one side of said impeller, a cover plate on an opposite side of said impeller, means defining an inlet cowl of said fan, said cowl being overlapped by said cover plate at a rounded guide thereof, said impeller having backwardly curving, generally airfoil-like blades with inner edges running at a slope in relation to an axis of turning of said impeller, said blades having an inner diameter decreasing from said cover plate to said support plate, the ratio between the mean inner diameter of said blades and the outer diameter thereof being generally equal to 0.7 to 1, the blades having an entry angle at the cover plate side that is 4° to 7° less than the entry angle thereof at the support plate side, said blades further having an exit angle at the cover plate side that is 3° to 6° smaller than the blade exit angle at the support plate side, the said blade entry angle at the cover plate side being between 14° and 20° and the blade exit angle at the cover plate side being between 39° and 45°.

4,526,507

SHAFT DRIVEN PUMP WITHOUT SEALS

Douglas J. Bingler, Furlong, Pa., assignor to Milton Roy Company, St. Petersburg, Fla.

Filed Jun. 14, 1982, Ser. No. 388,163
Int. Cl.[3] F04B *17/00*
U.S. Cl. 415—170 B 2 Claims

1. A fluid pumping apparatus comprising:

a housing;

a first pump chamber within the housing;

a fluid inlet into the housing and first chamber;

a fluid outlet from the first chamber and housing;

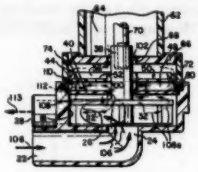
a second pump chamber within the housing and above the first chamber when the apparatus is in use;

first partition means of the housing defining a wall of the first pump chamber and a wall of the second pump chamber;

second partition means of the housing defining a wall of the second pump chamber and separating the two pump chambers from a remaining portion of the housing;

a first rotary impeller in the first chamber for urging a fluid from the inlet through the outlet;

rotable shaft means extending vertically through the second partition means, the second chamber and the first partition means, and into the first chamber for driving the first rotary impeller;



a first fluid passage around said shaft means through said first partition means;

a second fluid passage around said shaft means and through said second partition means; and

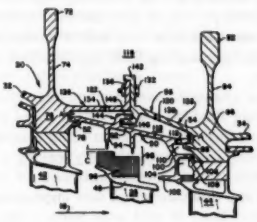
a second rotary impeller located in the second chamber primed with the fluid and operating on the fluid and driven by the rotatable shaft means for resisting the flow of the fluid passing through the first fluid passage from the first chamber into the second chamber towards the second fluid passage and urging the fluid from said second pump chamber through said first fluid passage and into said first pump chamber.

4,526,508

ROTOR ASSEMBLY FOR A GAS TURBINE ENGINE

Stephen M. Antonellis, Hebron, and Roger D. Breunig, Meriden, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 29, 1982, Ser. No. 427,109
Int. Cl.³ F01D *11/08*
U.S. Cl. 415—172 A **13 Claims**



10. A rotor assembly for an axial flow rotary machine having an axis of rotation, the rotor assembly extending outwardly across an annular flow path for working medium gases and having at least two axially spaced rotor disks each of which has a rim section, which comprises:

a seal which engages the rim section of each disk and which extends axially between the disks and circumferentially about the axis of rotation;

first means inwardly of the seal which is adapted to be attached to the disks and attached to the seal at a mid span location of the seal for joining the disks and for restraining the seal at a mid span location against thermal expansion, which engages the rim section of each disk at a point inwardly of the seal to form a first cavity inwardly of the first means, and which is spaced inwardly from the seal leaving a second cavity therebetween; and,

second means disposed in the second cavity for attaching the first means to the seal at a mid span location of the seal;

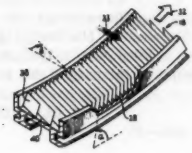
wherein the seal blocks the hot working medium gases from said first means decreasing the response of said first means to increases in the temperature of the working medium gases.

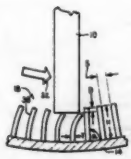
4,526,509

RUB TOLERANT SHROUD

Charles H. Gay, Jr., Loveland, and Dean T. Lenahan, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 26, 1983, Ser. No. 526,857
Int. Cl.³ F01D *11/08*; F16J *15/32*
U.S. Cl. 415—174 **10 Claims**





1. In a turbine engine including a rotating blade member, a rub tolerant shroud surrounding said blade member comprising:

a backing member; and

a plurality of generally planar strips having first and second edges, wherein each of said strips is substantially parallel to adjacent strips, and is within 30° of normal to the radial plane generally containing said rotating blade member;

wherein said first edge is joined to said backing member and said second edge is resiliently deflectable when in rubbing contact with said blade member.

4,526,510

DOUBLE-WALLED CENTRIFUGAL FAN SCROLL AND SYSTEM OF OPERATION

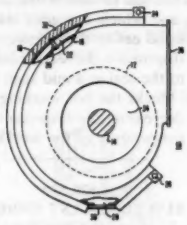
Joseph H. Hoffman, 15 Hemlock St., Norwood, Mass. 02062, and Steven R. Thayer, 97 Mill St., Weymouth, Mass. 02188

Filed Mar. 7, 1983, Ser. No. 472,628
Int. Cl.³ F04D *29/58*; F04B *23/04*
U.S. Cl. 415—175 **6 Claims**

1. For a centrifugal fan operating at least part of the time in an elevated temperature range of, say, above 600° F. (349° C.), an improvement comprising:

a spiral-shaped scroll assembly having a radially inner wall and a radially outer wall shaped apart from each other in a radial direction to define a hot gas passage therebetween extending for most of the length of the spiral shape, means controlling hot gas flow for said hot gas passage in a manner that said hot gas passages receives hot gas only when the fan is in a non-operating condition, and at a temperature sufficiently close to said elevated temperature range to avoid unacceptable vibrations upon start-up of the fan from the non-operating condition;

inlet means for admitting hot gas to one end of said hot gas passage; and



outlet means for discharging hot gas from the other end of said passage.

4,526,511

ATTACHMENT FOR TOBI

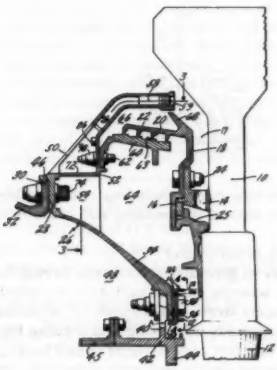
Richard Levine, Bloomfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 1, 1982, Ser. No. 438,145

The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.

Int. Cl.[3] **F01D** *5/18*

U.S. Cl. 416—95 **1 Claim**



1. For a gas turbine engine having a casing defining a chamber,

a cooling structure for supplying cooling air to said chamber, a turbine disk supporting turbine blades in said casing facing said chamber receiving said cooling air, the structure being a single unitary case article including:

spaced annular walls defining an air flow chamber and terminating at one end in an axially positioned discharge nozzle having vanes therein extending between the walls and integral therewith;

an annular connecting element integral with and connecting said walls at the ends remote from the nozzle, said element extending from said walls and having mounting means on the end remote from the wall;

feet-like elements extending from turbine stator vanes axially spaced from said turbine disk;

radially extending partitions integral with and between the spaced walls and defining circumferentially spaced flow passages for air from said connecting element to the nozzle, the element having air inlet holes therein;

an interrupted substantially cylindrical partition integral with and between said walls at a point spaced from said connecting element, said cylindrical partition being interrupted to form openings therein at points in alignment with the holes in the connecting elements for a flow of air from said holes to said openings between selected partitions and one of said annular walls having first access openings therein out of alignment with the holes in the connecting walls and the openings in the cylindrical partition, said outer annular wall having attachment means therein for access through the openings in said one of said annular walls;

a segmented ring mounted between said mounting means and a complimentary surface defined by said feet-like elements, spacers sandwiched between the face of said segmented ring and the complimentary face of the feet-like elements defining a gap for receiving cooler air relative to the air flowing to said turbine blades.

4,526,512

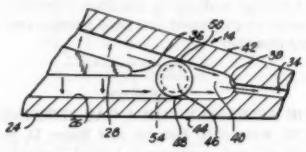
COOLING FLOW CONTROL DEVICE FOR TURBINE BLADES

Richard B. Hook, Burnt Hills, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,694

Int. Cl.[3] **F01D** *5/18*

U.S. Cl. 416—96 A **13 Claims**



1. Apparatus for modifying cooling fluid flow comprising:

a turbine vane;

an external surface on said turbine vane exposed to a gas flow at an elevated gas temperature;

said turbine vane including a leading edge and a trailing edge;

a hollow cored portion of said turbine vane defining a wall;

an impingement insert in said hollow cored portion effective for impinging a cooling fluid against a first inside portion of said wall;

a plurality of channels in said trailing edge effective to exhaust said cooling fluid from said hollow cored portion;

an end of said impingement insert being spaced upstream from said plurality of channels thereby leaving a wide portion in said hollow cored portion upstream of said plurality of channels and downstream of said impingement insert;

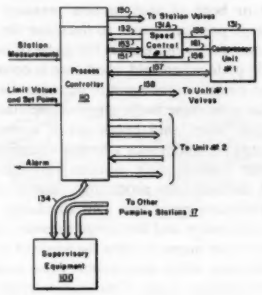
a flow control body in said wide portion interposed between said end of said impingement insert and said channels; and

said flow control body including a plurality of grooves therein defining a plurality of lands therebetween, said grooves being disposed generally in a direction of flow of said cooling fluid, said lands contacting an inside surface of said hollow cored portion in said wide portion and being effective for absorbing heat therefrom, said grooves having depths and a ratio to said lands effective to accelerate a flow of said cooling fluid adjacent said inside surface for cooling said inside surface in said wide portion and said flow control body whereby cooling uniformity of said turbine vane in a vicinity of said wide portion is enhanced.

4,526,513
METHOD AND APPARATUS FOR CONTROL OF PIPELINE COMPRESSORS

Graham D. Bogel, Woodbury, Conn., assignor to Acco Industries Inc., Trumbull, Conn.

Filed Jul. 18, 1980, Ser. No. 169,985
Int. Cl.[3] F04B 49/02, 49/06, 51/00
U.S. Cl. 417—5 15 Claims



1. In a pipeline for the transmission of gas, said pipeline having at least one pumping station where at least one centrifugal or axial compressor is used to pump gas through said pipeline, a method of changing the speed of said compressor from an initial value to a final value, said method comprising the steps of:

a. measuring operating parameters of said pumping station and said compressor;

b. calculating from the measured operating parameters the volumetric inlet flow at base conditions;

c. comparing the volumetric inlet flow at base conditions and the head with set point values for said volumetric inlet flow and head;

d. if a set point deviation exists, determining an incremental change in the speed of said compressor such that the operating efficiency of said compressor at said incremented speed approximately conforms to a predetermined operating curve extending between said initial value and said final value along which the operating efficiency of said compressor is approximately constant,

e. incrementing the speed of said compressor in accordance with the increment determined by step (d), and

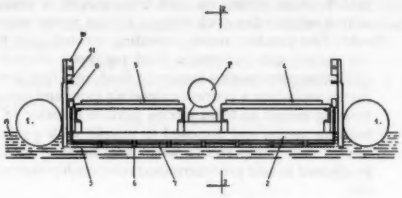
f. repeating steps (a) through (e) until the speed of said compressor reaches the desired final value, whereby the operating speed of the compressor is caused to change along a predetermined efficiency curve.

4,526,514
APPARATUS FOR PUMPING A VISCOUS MASS

Jean-Claude M. Duverne, 18, rue des Processions, Linas, F 91310 Montlhery, Essonne, France

Filed Mar. 29, 1984, Ser. No. 594,709
Claims priority, application France, Apr. 1, 1983, 83 05418
Int. Cl.[3] F04B 15/02, 23/00
U.S. Cl. 417—61 7 Claims

1. Apparatus for pumping a heavy viscous mass comprising a barge adapted to slide on the surface of said mass, said barge comprising a frame, a pump fixed to said frame, said pump being in communication with said mass, a net suspended by said frame and penetrating slightly said mass to define a surface

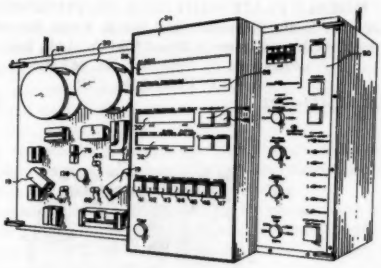


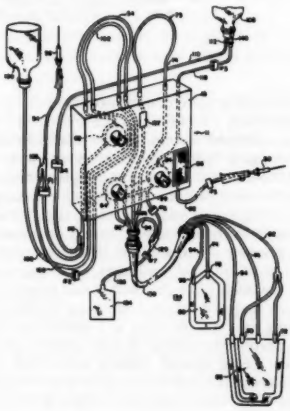
section of said mass, and heating means disposed slightly above the base of said net.

4,526,515
FLUID PUMPING ASSEMBLY INCLUDING A PREPACKAGED FLUID CIRCUIT MODULE

James H. DeVries, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 100,975, Dec. 6, 1979, Pat. No. 4,379,452, which is a continuation of Ser. No. 843,223, Oct. 18, 1977, abandoned. This application Sep. 27, 1982, Ser. No. 424,819
Int. Cl.[3] F04B 43/12, 45/08
U.S. Cl. 417—63 14 Claims





1. A fluid pumping assembly comprising

an apparatus including at last two spaced apart pump rotors, and

a prepackaged, self-contained fluid circuit module including housing means including means for removably positioning said housing means on said apparatus in a predetermined relationship with respect to said pump rotors,

flexible first conduit means extending through said housing means and defining a fluid pathway adapted for communication with a source of fluid, said first conduit means including a portion extending from and into said housing means to form a loop portion exterior of said housing means and disposed to interfit with a selected one of said pump rotors when said housing means is positioned in said predetermined relationship therewith, and

flexible second conduit means extending through said housing means and defining a fluid pathway adapted for communication with a source of fluid, said second conduit means including a portion extending from and into said housing means to form a loop portion exterior of said housing means and disposed to interfit with the other one of said pump rotors when said housing means is positioned in said predetermined relationship therewith,

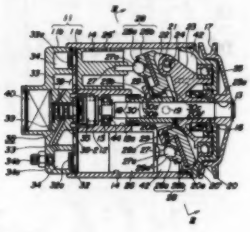
whereby it is assured that each of said first and second conduit means will interfit only with the correct one of said pump rotors when said fluid circuit module is positioned on said apparatus.

4,526,516

VARIABLE CAPACITY WOBBLE PLATE COMPRESSOR CAPABLE OF CONTROLLING ANGULARITY OF WOBBLE PLATE WITH HIGH RESPONSIVENESS

James C. Swain, Columbus, and Jan B. Yates, Reynoldsburg, both of Ohio, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1983, Ser. No. 467,404
Int. Cl.³ F04B *1/26, 1/28*
U.S. Cl. 417—222 **4 Claims**



1. In a wobble plate compressor comprising a housing having a crankcase, a suction pressure space and a discharge pressure space formed therein, a drive shaft rotatably disposed in said housing, a cylinder block disposed in said housing and formed therein with a plurality of cylinders circumferentially arranged around said drive shaft and extending substantially parallel to the axis of said drive shaft, said cylinders each being arranged to have an interior thereof communicate with said suction pressure space and said discharge pressure space, pistons received in said cylinders for reciprocating motions therein, a wobble plate disposed in said crankcase and fitted on said drive shaft for rotation in unison therewith, a first pivot supporting said wobble plate at a peripheral edge thereof for causing pivotal movement of same about said first pivot, said first pivot being spaced radially from said drive shaft and rotatable about the axis of said drive shaft in unison therewith, a second pivot supporting said wobble plate at a central portion thereof and axially movable along said drive shaft, said pistons engaging said wobble plate for reciprocating motions in said cylinders thereof as said wobble plate rotates, said wobble plate having an angle of inclination thereof relative to said drive shaft variable about said first pivot for varying displacement of said pistons, depending upon the difference between resultant reaction force exerted by said pistons on compression strokes thereof and pressure in said crankcase acting upon said pistons as back pressure, and elastic means permanently applying biasing force to said wobble plate in a direction of decreasing the angle of inclination of said wobble plate;

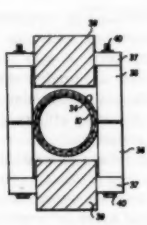
the improvement comprising control valve means responsive to a signal indicative of at least one predetermined parameter to selectively connect said crankcase with either or both of said suction pressure space and said discharge pressure space, to decrease the pressure in said crankcase for an increase in the angle of inclination of said wobble plate when said crankcase is connected with said suction pressure space and to increase the crankcase pressure for a decrease in the angle of inclination of said wobble plate when said crankcase is connected with said discharge pressure space wherein said pistons are disposed to make reciprocating motions through a slight stroke length sufficient for producing, respectively, in said suction pressure space and said discharge pressure space suction pressure and discharge pressure required for said control valve means to vary the angle of inclination of said wobble plate, when said wobble plate assumes a predetermined minimum angle of inclination relative to said drive shaft, and said control valve means establishes a closed circuit formed by said crankcase, said suction pressure space and said discharge pressure space to enable said pistons to make reciprocating motions through said slight stroke length.

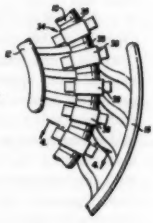
4,526,517

CIRCULAR CENTRIFUGAL PUMP WITH ARCUATE INPUT AND OUTPUT SECTIONS

Warren P. Clegg, P.O. Box 70133, Houston, Tex. 77270

Filed Feb. 9, 1984, Ser. No. 578,587
Int. Cl.³ F04B *17/04;* F01D *1/00*
U.S. Cl. 417—355 **10 Claims**





1. A centrifugal pump comprising a closed circular torus-shaped conduit for pumping fluids therein, an inlet header for delivering fluids to be pumped to said conduit, said inlet header being arranged concentrically and being inwardly spaced with respect to said conduit, a first set of a plurality of channels providing fluid communication between said inlet header and said conduit, an outlet header for delivering centrifugally pumped fluids from said conduit, said outlet header being arranged concentrically and being outwardly spaced with respect to said conduit and said inlet header, a second set of a plurality of channels providing fluid communication between said conduit and said outlet header, an impeller mounted in said conduit and being an annular disk having mounted thereon a plurality of centrifugal impeller vanes, said impeller rotating within said conduit to provide curvilinear motion to the fluids therein, and a plurality of stationary coil windings surrounding said conduit and spaced from one another along the conduit for supplying an electromagnetic force to induce and to continue the movement of the impeller within the conduit in order to drive the impeller therein.

4,526,518

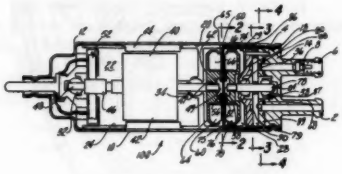
FUEL PUMP WITH MAGNETIC DRIVE

Michael V. Wiernicki, Trumansburg, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Continuation of Ser. No. 285,908, Jul. 23, 1981, abandoned. This application Sep. 27, 1984, Ser. No. 655,316

Int. Cl.³ F04B *35/04;* F01C *1/18*

U.S. Cl. 417—420 11 Claims



1. A compact fluid pump comprising:

a cylindrical housing having an open end, a closed end, and an axis of symmetry;

a planar non-magnetic diaphragm disposed in said housing normal to said axis of symmetry, said non-magnetic diaphragm dividing the interior of said housing into a motor chamber and a pump chamber;

an annular stator attached to the internal periphery of said housing in said motor chamber intermediate said non-magnetic diaphragm and said closed end of said housing;

an armature rotatably journalled in said motor chamber, said armature further being concentrically mounted relative to said annular stator, said armature having a motor shaft extending in a direction toward said non-magnetic diaphragm;

an annular drive magnet slidably attached to said motor shaft, said annular drive magnet further being disposed parallel to said non-magnetic diaphragm, said drive magnet having a plurality of alternating north and south magnetic poles disposed about its periphery adjacent to said non-magnetic diaphragm;

a pump shaft rotatably journalled in said pump chamber of said housing, said pump shaft further being concentrically mounted relative to said motor shaft of said armature;

an annular driven magnet attached to said pump shaft, said annular driven magnet further being parallel to said non-magnetic diaphragm in said pump chamber, said annular driven magnet having a plurality of alternating north and south poles disposed about its periphery and adjacent to said non-magnetic diaphragm, said plurality of alternating north and south poles of said annular driven magnet being equal to and magnetically coupled to said plurality of alternating north and south magnetic poles of said annular drive magnet through said non-magnetic diaphragm to rotate therewith;

gerotor pump means attached to said housing in said pump chamber, intermediate said non-magnetic diaphragm and said open end of said housing, said gerotor pump means further being driven by said pump shaft, said gerotor pump means having an inlet aperture and an outlet aperture; and

an end cap disposed about said open end of said housing enclosing said gerotor pump means, said end cap having an input port communicating with said inlet aperture and an outlet port communicating with said outlet aperture.

4,526,519

RECIPROCABLE PLUNGER FUEL INJECTION PUMP

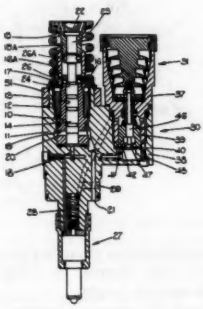
Dorian F. Mowbray, Burnham, and James C. Potter, London, both of England, assignors to Lucas Industries, Birmingham, England

Filed Jul. 19, 1983, Ser. No. 515,186

Claims priority, application United Kingdom, Aug. 3, 1982, 8222349

Int. Cl.³ F04B *7/04, 39/10*

U.S. Cl. 417—490 7 Claims



1. A reciprocal plunger fuel injection pump of the type which has a body, a plunger mounted within a bore defined in that body and adapted to move into and out of the bore and having a thrust member mounted thereon to cooperate with an associated engine component to move the plunger into the bore, comprising:

means for attaching the plunger to the body and simultaneously setting the plunger in a precisely determined position in the body bore, said means including

a first abutment means mounted on the plunger with which the thrust member cooperates to move the plunger,

a spring means surrounding the plunger and engaging said first abutment means for biasing the plunger outwardly of the body bore,

a second abutment means contacting said spring means and being located adjacent to the plunger,

a bore defined in the body to be adjacent to said second abutment means to have an axial length extending transverse to the plunger,

a stop means located in said transverse bore and having a dimension as measured along the axial length of said bore which exceeds the axial length of said bore,

first space defining means on the plunger located to cooperate with said bore for accommodating said stop means and holding said stop means in engagement with the body adjacent to said bore and also in engagement with the plunger for connecting the plunger to the body when the plunger is in a predetermined position with respect to the body whereat said bore and said space defining means become aligned,

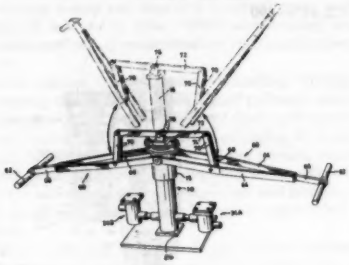
second space defining means on said second abutment means for accommodating said stop means when said first space defining means and said bore are not aligned, and holding said stop means in said bore and against the plunger at a location spaced from said first space defining means and permitting movement of the plunger with respect to the body,

wherein said plunger is reciprocable in said body between an outermost and an innermost position said predetermined position of said plunger being the outermost position of the plunger.

4,526,520
PUMP

James K. Henderson, 11 Parkend Ave., Brampton, Ontario, Canada L6Y 1B4

Continuation-in-part of Ser. No. 466,373, Feb. 15, 1983, abandoned. This application Feb. 27, 1984, Ser. No. 583,597
Int. Cl.³ F01B 9/00; F04B 17/00, 35/00
U.S. Cl. 417—559 4 Claims



1. Positive displacement pump having upright cylinder with plunger reciprocable therein, to define a plunger chamber therebelow of variable height,

inlet passage to the plunger chamber,

a valve in said inlet passage allowing flow only toward said chamber,

outlet passage from the plunger chamber,

a valve in said outlet passage allowing flow only out of said chamber,

said plunger projecting upwardly out of said chamber,

manual means for reciprocating said plunger comprising:

a pair of arms each arm being pivotally connected to said plunger cylinder, arranged to project therefrom on opposite sides of said cylinder,

a plunger link pivotally connected to said plunger adjacent the upper end and designed to extend transversely on each side thereof,

a pair of connector links,

each connector link being pivotally connected at one end to an arm and at the other end to the plunger link adjacent the corresponding end thereof,

the pivotal axes of said arms, plunger link and connector link being substantially horizontal,

said linkage being designed so that each said arm has a predetermined maximum arc of movement about its respective pivot points,

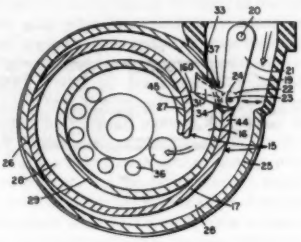
said connecting links being arranged to extend between their pivotal mountings with a vertical component throughout movement of said arms through said predetermined arc of movement.

4,526,521
ROTARY SPIRAL WALL PUMP WITH PIVOTABLY CONNECTED GUIDE MEANS AND ASSOCIATED METHOD

Rainer Südbeck, Wassenberg; Hans Baumgartner, Viersen, and Manfred Brandstädter, Dusseldorf, all of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co., Neuss, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 526,154
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231756
Int. Cl.³ F04C 2/04
U.S. Cl. 418—55 9 Claims

1. A positive displacement rotary pump for a fluid comprising a housing including a spiral wall, a piston including a spiral wall engaged in said spiral wall of said housing to form chambers therewith, said spiral wall of said piston extending over an angle greater than 360° to provide overlapping inlet and outlet ends, said piston further including a transverse plate from which said spiral wall extends axially on both sides of said transverse plate, said housing having a fluid inlet and a fluid outlet communicating with said chambers, and means for driving said piston within said housing to produce a pumping action on fluid in said chambers and convey the fluid from the inlet to the outlet, said means comprising an eccentric crankshaft pivotably connected to said transverse plate to drive the piston at a center of rotation along a closed circular path, and a swing arm pivotably connected to said housing at a first pivot

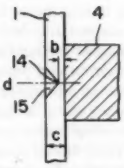


axis and to said piston at a second pivot axis, said second pivot axis being spaced from said center of rotation by a distance greater than the radius of said closed circular path to cause said piston at said second pivot axis to undergo reciprocal movement along an open path, said transverse plate having a radial terminal edge extending between said overlapping inlet and outlet ends, said swing arm being connected to said piston at said second pivot axis at a location where the ends of the spiral wall overlap one another, said transverse plate being confined in its radial direction within the outline of the spiral wall of said piston.

4,526,522
HERMETIC TYPE COMPRESSOR AND PRODUCTION METHODS THEREOF WITH REDUCED THICKNESS CASING PORTIONS FOR WELDING

Izumi Onoda, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 6, 1983, Ser. No. 511,244
Claims priority, application Japan, Jul. 8, 1982, 57-117845
Int. Cl.³ F04C 18/00, 29/00; B23K 31/02
U.S. Cl. 418—63 6 Claims



1. A hermetic type compressor comprising:

a casing of a totally enclosed type;

an electric motor accommodated in said casing for rotating a driving shaft; and

a compressor unit fitted in said casing and operatively connected to said electric motor for compressing a refrigerant,

said compressor unit comprising a cylinder forcibly inserted into said casing so as to contact with an inner surface of said casing, a roller coupled with an eccentric portion of the driving shaft so that said roller is eccentrically rotated in said cylinder, and a blade slidably contacting the outer

surface of said roller to be reciprocable in a groove formed in said cylinder to divide the internal space of said cylinder into a suction chamber and a compression chamber,

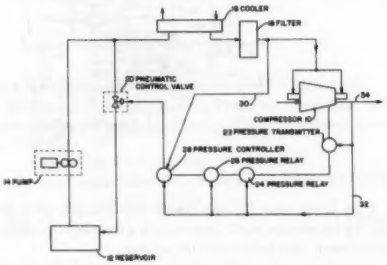
said casing being provided with reduced thickness portions each having a conical shape on the outer surface thereof in alignment with said cylinder through which spot welding can be carried out from outside of the casing for securing said compressor unit to said casing with a reduced amount of heat from the welded portions.

4,526,523

OIL PRESSURE CONTROL SYSTEM

Charles A. Parker, Saylorsburg, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 16, 1984, Ser. No. 610,678
Int. Cl.³ F04C *29/02;* **F04B** *39/02;* **F01M** *1/16, 5/00*
U.S. Cl. 418—84 **1 Claim**



1. In combination, a gas compressor having an oil pressure admittance requirement variable with the pressure of gas worked thereby, and a lubrication and seal oil pressure control system for said compressor, comprising:

reservoir means for providing a source of oil;

a pump;

first means communicating said pump with said reservoir means;

second means interposed between, and communicating, said pump and said reservoir means for controlling oil flow from said pump to said reservoir means;

a gas compressor;

a conduit communicating with said first means, intermediate said pump and said second means, for conducting oil to said gas compressor; wherein

said second means comprises means, responsive to fluid-pressure, pilot signals communicated thereto for modulatingly regulating oil flow to said reservoir means; and further including

sensor means intrusively coupled to said compressor for (a) sensing the pressures of fluid worked by said compressor, and (b) producing fluid pressure, pilot signals representative of such sensed pressures;

means mutually coupling said sensor means and said second means for communicating pilot signals, produced by said sensor means, to said second means;

an oil cooler, interposed between said pump and compressor, for passing oil therethrough and for cooling oil therewithin;

said cooler having coolant supplied thereto, and passed therethrough at a given pressure, for cooling of oil therewithin; and

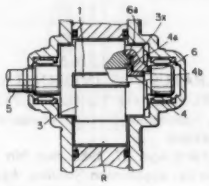
means interposed between said sensor means and said second means for (a) gauging said pilot signals to determine the fluid pressure levels thereof, and (b) enhancing said pilot signals, as required, to insure that the latter maintain at least a given, lowermost, pressure threshold in which said pump supplies oil to said oil cooler at a pressure which is greater than said given pressure.

4,526,524

VANE COMPRESSOR

Makoto Kondo; Eiichi Nagasaku, both of Chiryu; Yuuji Yamamoto, Anjo, and Tosiki Taya, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 7, 1984, Ser. No. 618,353
Claims priority, application Japan, Jun. 8, 1983, 58-102247
Int. Cl.³ F04C *18/00*
U.S. Cl. 418—255 **3 Claims**



1. A vane compressor comprising:

(a) a rotatable drive shaft;

(b) a cylindrical rotor rotatable with said rotatable driven shaft and having vane slots defined in the rotor and extending from one end surface thereof fully across the rotor;

(c) vanes slidably disposed in said vane slots;

(d) a rotor cover disposed in covering relation to said one end surface of said rotor;

(e) a housing accommodating said rotor therein, said housing, an outer peripheral surface of said rotor, and said vanes jointly defining a working chamber;

(f) said one end surface of said rotor having a ring-shaped locking ridge, said rotor cover having on an inner surface thereof a locking groove in which an outer peripheral surface of said locking ridge engages; and

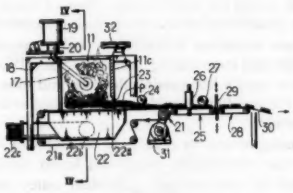
(g) a holder held by said rotor cover against an inner peripheral surface of said locking ridge.

4,526,525

FLEECY CONFECTIONERY PRODUCING MACHINE

Hisayoshi Oiso, Tokyo; Norio Joyama, Yokohama; Kazuhiro Fujimoto, Yachiyo, and Kozo Okamoto, Kyoto, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Apr. 6, 1984, Ser. No. 597,313
Claims priority, application Japan, Apr. 8, 1983, 58-60917; Apr. 8, 1983, 58-51600[U]
Int. Cl.³ B29C *17/10;* **B29F** *3/08;* **A23G** *3/18*
U.S. Cl. 425—9 **9 Claims**



1. In a fleecy confectionery producing machine comprising a rotary confectionery extruding cylindrical member adapted to hold confectionery material thrown therein and having a plurality of through holes in the periphery of said cylindrical member for extruding molten confectionery therethrough and a material melting chamber formed in the interior of said cylindrical member in communication with said through openings and heating means for heating said melting chamber, characterized by that said confectionery extruding cylindrical member is formed of magnetic material, a cylindrical portion is integrally formed with said cylindrical member at one end

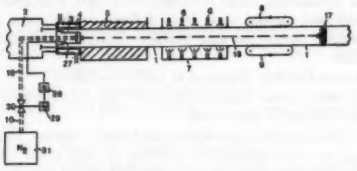
thereof in coaxial relationship to the cylindrical member, said cylindrical portion being formed on the inner periphery of the cylindrical member, a stationary cylindrical member is provided within said cylindrical portion in coaxial relationship to the cylindrical portion and an exciting coil is supported on said stationary cylindrical member facing the inner peripheral surface of said cylindrical portion whereby when said exciting coil is energized by supplying current from an AC power source to the coil, said rotary confectionery extruding cylindrical member is heated.

4,526,526

APPARATUS FOR INTERNAL COOLING IN EXTRUSION OF TUBE-SHAPED OBJECTS

Björn Krogh, Sollentuna, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Apr. 27, 1983, Ser. No. 488,952
Claims priority, application Sweden, Apr. 29, 1982, 8202687
Int. Cl.³ B29F *3/08*
U.S. Cl. 425—71 **7 Claims**



1. An apparatus for internally cooling a tube of hot plastic material extruded by an extruder nozzle, said apparatus comprising:

evaporator means mounted adjacent to said extruder nozzle so as to be within a tube of hot plastic material extruded by said extruder nozzle, said evaporator means including an elongated evaporating chamber having a cylindrical outer member with good thermal conductivity extending axially along and in spaced relation to the inner surface of said extruded tube so as to be heated by said hot extruded material, said spaced relation providing an annular cooling passage between the outermost surface of said outer member and the inner surface of said extruded tube along the greater portion of the axial length of said outer member, one end of said evaporating chamber being closed and the opposite end of said evaporating chamber having outlet openings for passing a nitrogen gas from said evaporating chamber into said cooling passage;

supply means for introducing a flow of liquid nitrogen into the closed end of said evaporating chamber, said supply means including at least one nozzle member positioned inside said evaporating chamber adjacent to its closed end and a supply line passing through said tube extruder nozzle for supplying liquid nitrogen to said at least one nozzle member;

regulating means for regulating said flow of liquid nitrogen so that substantially all of said liquid nitrogen is evaporated by said heated cylindrical outer member before reaching said outlet openings, said regulating means including a temperature-sensing member positioned in the vicinity of at least one of said outlet openings and said flow of said liquid nitrogen being regulated so that the temperature sensed by said sensing member is always higher than the evaporation temperature of said liquid nitrogen at the pressure prevailing in said extruded tube; and,

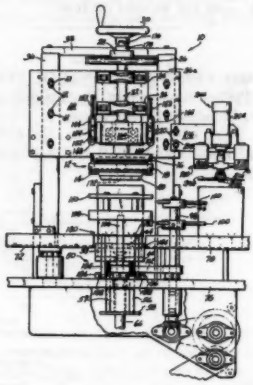
means for causing said evaporated nitrogen to pass through said outlet openings and into said cooling passage so as to cool the inner surface of said extruded tube.

4,526,527

ROUND TOP RIMMING MACHINE

Eugene A. Koll, Moundsview, Minn., assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 357,837, Mar. 15, 1982, Pat. No. 4,433,968. This application Jun. 20, 1983, Ser. No. 505,688
Int. Cl.³ B29C *17/02*
U.S. Cl. 425—90 **9 Claims**



1. A lubricator for the inside top margin of a workpiece having an annular wall upon which a forming operation is to be performed, said lubricator including:

support means to maintain an annular wall of a workpiece in an upstanding position thereby to create an annular wall top end;

deflector means including an area of magnitude sufficient to act as an end closure for said annular wall top end;

said deflector mounted for axial movement into and out of engagement with said annular wall top end;

spray means for producing an annular spray pattern of atomized aqueous material on the inside top margin of said annular wall;

said spray means located centrally within said deflector means area and fixed axial movement with said deflector; and,

means to actuate said spray means when said deflector is in engagement with said annular wall top end.

4,526,528

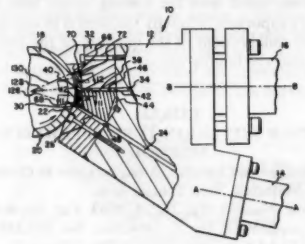
APPARATUS FOR FORMING A CO-EXTRUSION FROM EXTRUDED STRIPS

John W. Kline, Uniontown, and Donald W. Ward, Silver Lake, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 28, 1984, Ser. No. 625,644
Int. Cl.³ B29D *7/02*; B29F *3/04*
U.S. Cl. 425—133.5 **17 Claims**

1. A multiple orifice roller die extrusion apparatus for combining extrudable strips of elastomeric materials into a formed co-extrusion, said apparatus having a roller with an axis circumvented by a roller surface and means for rotating said roller about said axis, comprising die head means positioned adjacent to and having a generally cylindrical surface conforming to said roller surface, a first orifice and a second orifice in said die head means at spaced-apart positions, said first orifice being located for applying at least a first strip of elastomeric material over said roller surface, said second orifice being located for applying at least a second strip of elastomeric material over said roller surface at said spaced-apart positions, said die head means including at least a first finish die replaceably mounted on said cylindrical surface, said first finish die having an indented edge forming said first orifice with a wall

surface of said die head means and said first finish die having a first grooved surface for guiding the elastomeric material of at



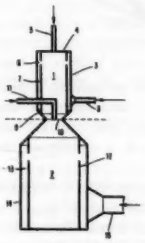
least said first strip after application over said roller surface to form a single co-extrusion of said first strip and said second strip.

4,526,529

CLEAN COMBUSTION PROCESS/APPARATUS

Philippe Bernard, Paris, and Francois Prudhon, Versailles, both of France, assignors to Rhone-Poulenc Chimie De Base, Courbevoie, France

Filed May 21, 1984, Ser. No. 612,543
Claims priority, application France, May 20, 1983, 83 08393
Int. Cl.³ F23M *3/00*
U.S. Cl. 431—9 **21 Claims**



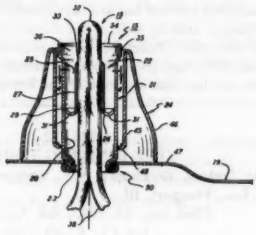
1. A process for the clean combustion of a combustible material, comprising (i) in situ generating a dispersing first stream of hot combustion gases by establishing a first downstream axially extending, axially symmetrical helical flowstream of combustion-supporting gases in a first combustion reaction zone and by introduction and combustion of a combustible fluid feedstream therein, (ii) serially directly contacting and intimately admixing the material cleanly combustible hereby with said first stream of hot combustion gases at a zone of reduced pressure thereof defining the inlet end of a second combustion reaction zone and whereat and downstream thereof said first stream of hot combustion gases is also in the configuration of an axially symmetrical helical flowstream, (iii) the amounts of said combustion-supporting gases and said combustible fluid being such as to effect essentially instantaneous dispersion and entrainment of fine particles of said cleanly combustible material at and downstream of said point of direct contact with said first stream of hot combustion gases, (iv) establishing a second downstream axially extending, axially symmetrical helical flowstream of combustion-supporting gases in said second combustion reaction zone, and (v) whereby said cleanly combustible material dispersed and entrained within said first stream of hot combustion gases is introduced into and combusted within said second stream of combustion-supporting gases in said second combustion reaction zone.

4,526,530

BURNER FOR LIQUID CANDLE

J. Alan Menter, Fayetteville, and Gerald A. Menter, Jamesville, both of N.Y., assignors to Hollowick, Inc., Manlius, N.Y.

Filed Mar. 28, 1984, Ser. No. 594,336
Int. Cl.³ F23Q *25/00*
U.S. Cl. 431—34 **18 Claims**



14. A burner for use in a liquid candle having a container for storing liquid fuel, said burner including

a hollow stud mounted in the top of the container so that the stud is vertically disposed above the container,

a hollow wick holder being fully contained inside the stud with the outside wall of the holder forming an elongated flow passage with the inside wall of the stud,

a horizontally extended closure wall at the base of the wick holder that is locked against the inside wall of the stud to position the top of the holder just beneath the top of the stud to form an upper entrance to the flow passage,

a wick contained in the holder, the tip of the wick being located a predetermined distance above the top of the stud so that the wick flame completely envelopes the entrance to the flow passage when the wick is lighted and the bottom of the wick being immersed in the liquid fuel, stored in the container, and

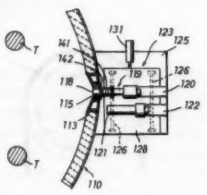
said closure wall further including a primary venting means passing therethrough to allow fuel vapor in the container to move upwardly through the flow passage into the passage entrance where it is consumed by the flame and to allow liquid fuel drawn to the top of the wick to move downwardly through the passage and be returned to the container.

4,526,531

BURNER APPARATUS FOR SMELTING FURNACE

Tatsuya Kai, Kobe, Japan, assignor to Nikko Co,, Ltd., Hyogo, Japan

Filed Jun. 6, 1983, Ser. No. 501,243
Int. Cl.³ F23C *5/06*
U.S. Cl. 431—189 **4 Claims**



1. A burner apparatus for a smelting furnace comprising:

a burner body having a tip insertable into and withdrawable from a burner inserting bore formed in the wall of the furnace;

a seal bar insertable into and withdrawable from the inserting bore for closing the bore;

shifting means for alternatively positioning the tip or the seal bar on an extension of the axis of the inserting bore in alignment therewith;

means for driving the tip and the seal bar into and out of the inserting bore, and wherein the shifting means comprises a stationary support, a lift member supported on the support and movable in the direction of the height of the furnace and a drive assembly for the lift member, and the burner body and the seal bar are supported on the lift member and arranged side by side in the direction of the height of the furnace, the lift member being provided with drive assemblies for respectively reciprocatingly moving the tip and the seal bar into and out of the inserting bore.

4,526,532

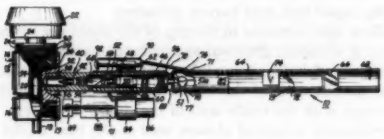
SELF-IGNITING TORCH

John M. Nelson, Brockport, N.Y., assignor to Newell Companies, Inc., Freeport, Ill.

Filed Aug. 15, 1983, Ser. No. 523,822

Int. Cl.³ F23Q *7/00*

U.S. Cl. 431—255 **26 Claims**



1. A torch comprising: a housing; an orifice tube mounted in the housing and stationary with respect thereto and receptive at one end of a source of combustible fluid; normally closed valve means disposed in the orifice tube; orifice means slidably disposed in said orifice tube through the other end thereof for opening the valve upon movement towards said one and of the orifice tube; means biasing said orifice means away from the valve means; a burner tube slidably engaged at one end thereof on the orifice tube; means mounting the burner tube for movement with the orifice means; and means for manually moving the orifice means against the action of the biasing means to open said normally closed valve means.

4,526,533

CYLINDER FOR GUIDING A WEB OF TEXTILE MATERIAL

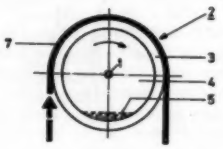
Manfred Pabst, Cologne, Fed. Rep. of Germany, assignor to A. MONFORTS GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,691

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139254

Int. Cl.³ F28D *11/02*; F28F *5/02*

U.S. Cl. 432—4 **9 Claims**



6. Method of treating a web of textile or similar flexible material guided over a cylinder having a shell, at least one hollow space formed in the shell, and means disposed outside the cylinder for heating the hollow space, which comprises selecting a predetermined maximally permissible vapor pressure in the hollow space, filling a quantity of heat carrier liquid into the hollow space which can be completely evaporated in the volume of the hollow space before the predetermined maximally permissible vapor pressure is reached, and heating the heat carrier liquid with the heating means until the heat carrier liquid evaporates, whereby the shell is in turn heated to a temperature independent of the quantity of the heat carrier liquid filled into the hollow space.

4,526,534

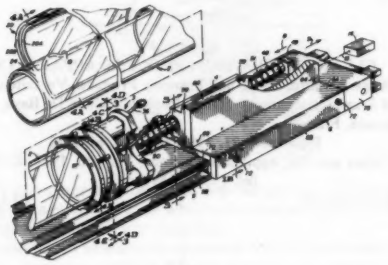
CANTILEVER DIFFUSION TUBE APPARATUS AND METHOD

Andrew F. Wollmann, Chandler, Ariz., assignor to Quartz Engineering & Materials, Inc., Tempe, Ariz.

Division of Ser. No. 499,915, Jun. 1, 1983, Pat. No. 4,459,104. This application Apr. 9, 1984, Ser. No. 598,224

Int. Cl.³ F27D *3/00, 7/00*; F27B *9/04, 3/22*

U.S. Cl. 432—11 **14 Claims**



14. A method of processing a plurality of semiconductor wafers in a furnace, said method comprising the steps of:

(a) holding a rigid, heat-resistant tube having a first end and a second end in a cantilever manner by said first end thereof;

(b) placing said plurality of wafers in spaced relationship to each other inside said tube;

(c) causing a first gas to flow into said tube between said wafers and out of said tube;

(d) moving said tube with said wafers therein into said furnace to position said plurality of wafers in a hot zone of said furnace;

(e) stopping the flow of said first gas into said tube;

(f) causing a reactant gas to flow into said tube, between said wafers in said hot zone, and out of said tube;

(g) stopping the flow of said reactant gas into said tube after the elapsing of a predetermined amount of time;

(h) causing a second gas to flow into said tube, between said plurality of wafers, and out of said tube;

(i) moving said tube and said wafers therein out of said hot zone of said furnace while continuing said flow of said second gas; and

(j) removing said plurality of wafers from said tube.

4,526,535

GAS BURNER FOR A COMBINED LAUNDRY APPLIANCE

Daniel F. Wunderlich, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

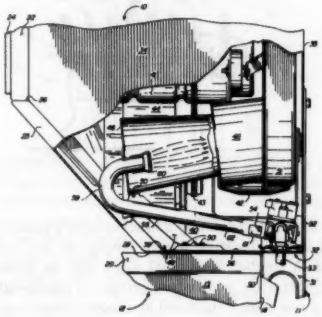
Filed Dec. 27, 1983, Ser. No. 565,733

Int. Cl.³ F27B *7/36*; F23D *13/40*; D06F *29/00*

U.S. Cl. 432—105 **5 Claims**

1. The dryer of a combination stack washer/dryer with a gas burner adapted for operation in an area of reduced front-to-rear depth, the combination comprising: means defining a compartment for housing the gas burner, said compartment including a lower front wall portion disposed rearward from

the vertical plane of the front of the dryer so that the lower portion of said compartment is reduced in fron-to-rear depth with respect to the top portion; means defining a combustion chamber including a body portion having an inlet juxtaposed to said front wall portion and an outlet in airflow communication with the interior of the dryer and operable for burning gas to heat air to be conducted into the dryer; gas valve means mounted within said compartment and operable for providing gas to said gas burner; and an elongated gas burner pipe including a lower leg portion extending forwardly from the outlet of said gas valve means within said compartment, said gas burner pipe further including an upper leg portion formed to substantially double back on said lower leg portion and extend rearwardly into said inlet of said combustion chamber whereby said elongated gas pipe conducts the flow of gas from said gas valve means into said combustion chamber and permits said gas burner including said elongated gas burner pipe to be located within said compartment of reduced front-to-rear depth.



4,526,536

COOLING APPARATUS FOR USE IN CONJUNCTION WITH A CHARGING DEVICE FOR A SHAFT FURNACE

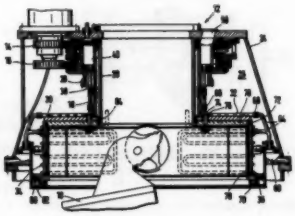
Edouard Legille, Luxembourg; Gilbert Bernard, Helmdange; Giovanni Cimenti, Fentange, and Guy Thillen, Diekirch, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Dec. 12, 1983, Ser. No. 560,492

Claims priority, application Luxembourg, Dec. 10, 1982, 84521

Int. Cl.³ F27D *1/12*

U.S. Cl. 432—238 **20 Claims**



1. A cooling apparatus for use in conjunction with a charging device of a shaft furnace, said charging device comprising a fixed feed channel positioned vertically about an axis of said furnace, a rotary housing mounted coaxially around said feed channel, said rotary housing having first and second sections, a fixed outer frame mounted coaxially about said first houding section, a distribution spout being pivotally mounted to said second housing section, first driving means which urges said housing and spout to rotate as a single unit about said furnace axis and said feed channel, and a second driving means which causes said spout to pivot about the axis by which it is suspended from said second housing section, said cooling apparatus including:

annular feed vat means attached to said rotary shell;

feed pipe means connected to at least one opening in said fed vat means whereby cooling water is gravity fed therethrough into said vat means;

at least one cooling coil attached to said second housing section;

connecting pipe means providing communication between said vat means and said cooling coil whereby cooling water may be gravity fed therethrough;

collecting conduit means fixed to the bottom portion of said outer frame; and

second connecting pipe means providing communication between said cooling coil and said collecting conduit means whereby water gravity flows between said annular fed vat means and said collecting means.

4,526,537

APPARATUS FOR HEAT TREATMENT OF MATERIAL IN PIECES AT HIGH TEMPERATURE

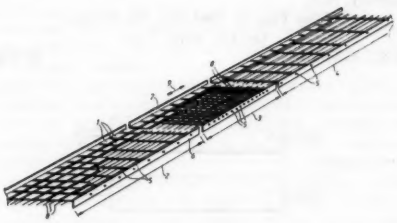
Karl F. Rumbach, Hanau, Fed. Rep. of Germany, assignor to Agrob Anlagenbau GmbH, Ismaning, Fed. Rep. of Germany

Filed Apr. 29, 1983, Ser. No. 490,176

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3217176

Int. Cl.³ F27D *3/00*; B65G *29/00*

U.S. Cl. 432—239 **15 Claims**



1. Apparatus for the heat treatment at high temperature of piece material comprising a plurality of rotatable carrier elements, fixed frame means mounting said carrier elements at spaced apart intervals for rotation about fixed, parallel, individual axes; and a plurality of sets of side-by-side, elongate supports extending athwart said carrier elements and resting upon the latter for movement along a path transverse to said axes, said sets of supports being independent of and spaced apart from one another by a distance which is a multiple of their width, each of said supports comprising a plurality of individual, elongate elements of such length as to span adjacent ones of said carrier elements and of such rigidity as to support, with other of said support elements, said piece material without appreciable deformation.

4,526,538

DEVICE FOR SUPPORTING FLAT CERAMIC OBJECTS TO BE FIRED IN A CONTINUOUSLY HEATING FURNACE

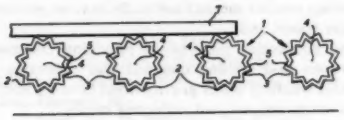
Dietrich Redell, Berlin, and Dieter Schmidt, Aschau, both of Fed. Rep. of Germany, assignors to W. Haldenwanger Technische Keramik GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 13, 1984, Ser. No. 570,514

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1983, 3301660

Int. Cl.³ F27D 3/00; F24D 23/02

U.S. Cl. 432—246 7 Claims



1. A device for supporting and conveying flat ceramic objects to be fired in a continuous heating furnace comprising:

a plurality of co-planar rollers each rotatable about a longitudinally extending central axis, the rollers having a tubular configuration with an outer surface, each roller having a plurality of radially extending, circumferentially spaced, alternating, raised and indented portions formed in the outer surface and extending longitudinally along each roller.

4,526,539

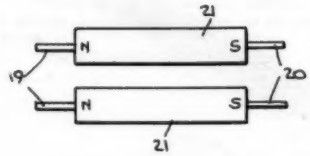
PALATAL RETENTION DEVICE

Abraham Blechman, Tappan, N.Y., and Eugene A. Pescatore, Elmwood Park, N.J., assignors to Medical Magnetics, Inc., Ramsey, N.J.

Filed Feb. 29, 1984, Ser. No. 584,813

Int. Cl.³ A61C 7/00

U.S. Cl. 433—18 10 Claims



1. An orthodontic device for inhibiting lingual movement of a maxillary arch bordering a natural palate with a gap therein while promoting osteogenesis to close said palatal gap, comprising a palate body having an outer edge contiguous to and in general conformance with the lingual contouring of the teeth of said maxillary arch, and a plurality of permanent magnets carried by said palate body, said magnets being movable relative to one another and subject to intra-oral lingual activity for developing a fluctuable magnetic flux field adapted to induce mild electric currents in the bone structure of the natural palate on either side of said gap sufficient to promote osteogenesis to close said gap.

4,526,540

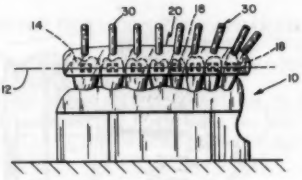
ORTHODONTIC APPARATUS AND METHOD FOR TREATING MALOCCLUSION

Eugene L. Dellinger, 1326 Old Lantern Ter., Ft. Wayne, Ind. 46825

Filed Dec. 19, 1983, Ser. No. 562,858

Int. Cl.³ A61C 7/00

U.S. Cl. 433—24 19 Claims



1. Apparatus for positioning a bracket onto a patient's tooth comprising a rigid locating fixture having an internal cavity provided with lingual and labial sides and an incisal edge portion therebetween; said fixture being of a plural-state material which in one state is rigid and in a second state is non-rigid, dissolved, flexible, soft or pliable, said material being alterable from said one to said second state by the application of a state-changing medium thereto, said lingual side, incisal edge portion and a first portion of said labial side conforming to the surface anatomy of the corresponding portions of a patient's tooth, a bracket having head and base portions, a second portion of either said labial or lingual side while in said one state being fixedly secured to and not removeable from the head portion of said bracket with the latter being in such position as to orient said base in the same anatomical surface as said first portion of said labial or lingual side.

4,526,541

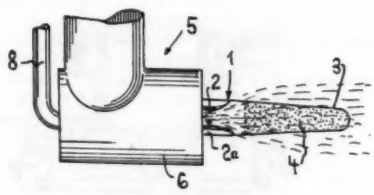
INSTRUMENT FOR THE TREATMENT OF INTERDENTAL SURFACES

Walter Hubschmid, Carabietta, Switzerland, assignor to Walter Hubschmid & Sohn, Viganello, Switzerland

Filed Jul. 14, 1983, Ser. No. 513,833

Int. Cl.³ A61C 3/02

U.S. Cl. 433—165 5 Claims



1. An interdental surface treatment apparatus comprising:

a dental tool having a bored, reciprocable holder and a fluid supply conduit in communication with said holder; and

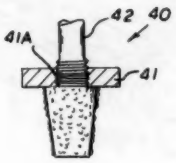
a dental instrument having a flexible blade including at least one diamond abrasive surface bonded thereto and a pair of mutually opposed, bowed ears attached to said blade, said ears being biasedly inserted into said reciprocable holder bore, said ears forming a channel therebetween for directing fluid between said fluid supply conduit and said abrasive surface.

4,526,542

DENTAL BURR AND METHOD OF PREPARING A TOOTH

Robert Kochis, 39 Elaine St., Trumbull, Conn. 06611

Filed Feb. 6, 1984, Ser. No. 577,211
Int. Cl.³ A61C *3/02*
U.S. Cl. 433—165 **1 Claim**



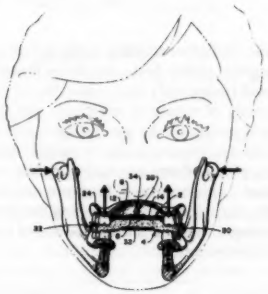
1. A dental burr comprising a shank having a connected working burr head, said burr head having a predetermined length substantially equal to the depth of a test trough cut into a tooth, and a means to limit the penetration of said burr head during a tooth restoration procedure to the depth of the test trough, wherein said burr head is formed with a diamond abrading surface, said limit means including a laterally extending flange, and means for detachably connected said flange to the said shank of said burr, wherein said detachably connecting means includes complimentary threads formed on said flange and said shank whereby said flange is threaded to said shank, and said threads being threaded in a direction opposite to the rotation of said burr head.

4,526,543

FUNCTIONAL DENTAL-BALANCING METHOD AND APPARATUS

Martin A. Hass, 11704 Wilshire Blvd., Ste. 222, Los Angeles, Calif. 90025

Filed Apr. 2, 1984, Ser. No. 595,930
Int. Cl.³ A61C *9/00*
U.S. Cl. 433—214 **3 Claims**



1. The method of balancing natural and denture teeth by making a chew-in occlusion directly in a human mouth comprising the steps of:

(a) Placing a resilient member in the mouth positioned to cover for right and left corresponding partial portions of the occlusal surfaces of the teeth;

(b) Covering the uncovered occlusal surfaces of the teeth on one jaw with a conformable substance that hardens to a permanent conformed shape;

(c) Urging the upper and lower jaws to chew naturally against said resilient member to form the conformable shape;

(d) Removing said resilient member from the mouth after said conformable substance has hardened;

(e) Filling in the occlusal surface formerly covered by said resilient member with more of said conformable substance;

(f) Urging the upper and lower jaws together to form said conformable substance covering the occlusal surface formerly covered by said resilient device and hardening said conformable substance.

4,526,544

CYANOACRYLATE ROOT CANAL SEALER

Henry Kahn, 1724 Grand Bahama West, Palm Springs, Calif. 92262

Filed Nov. 18, 1983, Ser. No. 553,259
Int. Cl.³ A61C *5/02*
U.S. Cl. 433—224 **11 Claims**

1. A method of endodontically treating a tooth comprising:

(A) removing tissue from the root canal;

(B) shaping said root canal; and

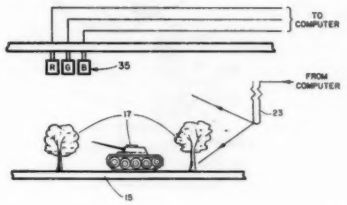
(C) sealing the surfaces of said root canal with an cyanoacrylate resin solution.

4,526,545

DIURNAL EFFECTS SIMULATOR

Windell N. Mohon, Athens, Ala., and Jimmy H. Burns, Maitland, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1983, Ser. No. 493,860
Int. Cl.³ G09B *9/00*
U.S. Cl. 434—38 **1 Claim**



1. Apparatus for simulating diurnal effects in a military training device for operational infrared optical equipment, comprising:

a light source composed of first, second and third separately modulated lasers providing red, green and blue illumination, respectively, wherein the intensity of each said laser is selectably variable;

a modelboard illuminated by said light source, having a combination of terrain features simulated in miniature and miniature replicas of military equipment, wherein said replicas simulate varying operational military equipment that are identifiable by their respective thermal signatures, and wherein selected surfaces of said replicas are coated with one or more various pigments that are predeterminedly responsive to the illumination from one or more of said lasers such that by choosing the pigments of said coatings, the surfaces to be coated by each said coating, and the intensity of the illumination from each said laser, the visual appearance of said replicas may be made to simulate the thermal signatures of said operational equipment, respectively, as said signatures would be perceived with the use of thermal sensitive equipment in the operational military environment;

first, second and third photomultiplier tubes positioned to receive reflected light from said model board illuminated by said light source, wherein said first photomultiplier tube includes a filter so as to sense reflected illumination from said red laser, said second photomultiplier tube includes a filter so as to sense reflected illumination from said green laser, and said third photomultiplier tube in-

cludes a filter so as to sense reflected illumination from said blue laser;

computer means coupled to said light source and to said first, second and third photomultiplier tubes, for controlling the intensity of said red laser, the intensity of said green laser and the intensity of said blue laser and for processing the responses of said first, second and third photomultiplier tubes for visual presentation;

visual means coupled to said computer means for presenting images of said features and said replicas from the responses of said first, second and third photomultiplier tubes;

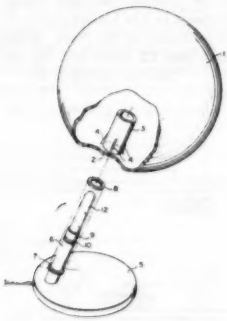
such that said visual presentation is an accurate simulation of said diurnal effects for training.

4,526,546

FULLY ROTATIONAL ILLUMINATED GLOBE

Merle J. Schaeffer, Silver Spring, Md., assignor to National Geographic Society, Washington, D.C.

Filed Jul. 11, 1984, Ser. No. 629,800
Int. Cl.³ G09B *27/08*
U.S. Cl. 434—145 **3 Claims**



1. A fully-rotational illuminated globe comprises:

(a) a base;

(b) a post affixed to said base, said post having:

(i) a bearing surface located intermediate to the end points of said post, and

(ii) a hollow center;

(c) a lamp socket attached to said post; the wiring for said lamp socket passing through the hollow center of said post; and

(d) a translucent globe defining an aperture at one pole thereof, said globe having a sleeve integral with said globe and located at the aperture thereof, so that said globe removably and rotatably engages said post and rests on said bearing surface, and said post and bearing surface provide the sole means of support for said globe.

4,526,547

WRITING AID AND METHOD OF TEACHING USING THE WRITING AID

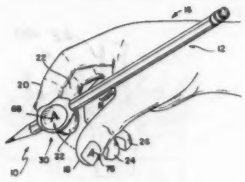
Chris E. Rusk, 1007 Wayne Ave., Crawfordsville, Ind. 47933

Filed Jul. 26, 1984, Ser. No. 634,835
Int. Cl.³ G09B *11/00*; B43L *15/00*
U.S. Cl. 434—166 **14 Claims**

1. A method for teaching a young child how to grip an elongated, hand-held writing instrument properly, comprising the steps of

providing a device for aiding in the gripping of the writing instrument, the device including a body having a central bore for receiving the writing instrument, and an exterior surface having a first gripping surface positioned for receiving the person's first finger, a second gripping surface positioned for receiving the person's second finger and a third gripping surface positioned for receiving the person's third finger,

providing a surface indicia means on at least one of the first, second, and third gripping surfaces, the surface indicia



means comprising one of the first, second, and third gripping surfaces having a color different than the color of the other two of the first, second, and third gripping surfaces, and

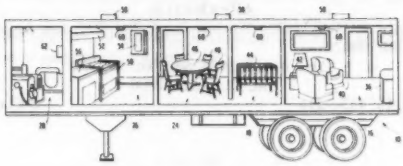
instructing the young child to place a designated one of his fingers on the surface bearing the indicia means.

4,526,548

MOBILE FIREFIGHTER TRAINING EQUIPMENT

Arnold M. Livingston, Millington, N.J., assignor to Tifa Limited, Millington, N.J.

Filed Nov. 1, 1984, Ser. No. 667,030
Int. Cl.³ G09B *9/00*
U.S. Cl. 434—226 **4 Claims**



1. A mobile firefighter training trailer comprising a substantially rectangular trailer body, partition means dividing the interior of said trailer body into a plurality of rooms and passages, a plurality of simulated appliances and furniture pieces located in said trailer, smoke generating means for generating and effectively distributing smoke to said simulated appliances and furniture pieces, flame generating means associated with said simulated appliances and furniture pieces and central control means for selectively controlling the operation of said flame generating means and the distribution of smoke from said smoke generator means.

4,526,549

CELESTIAL GLOBE

R. Stephen Rea, 11253 Brownell, Plymouth, Mich. 48170

Filed Sep. 20, 1984, Ser. No. 652,129
Int. Cl.³ G09B *27/06*
U.S. Cl. 434—288 **5 Claims**

1. A celestial globe for demonstrating the relationship between the earth and celestial bodies comprising:

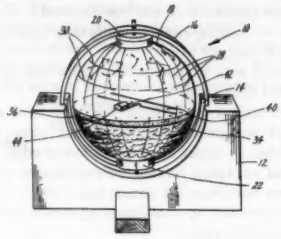
a base;

a hollow sphere having an interior viewable from a position exterior of the sphere;

means representing celestial objects mounted on the sphere;

support means mounted on the base and supporting the sphere such that it is movable about two mutually perpendicular axes with respect to the base;

liquid means disposed in the sphere and partially filling same; and



means floating on the liquid means to form a reference point with respect to the celestial objects portrayed on the sphere.

4,526,550

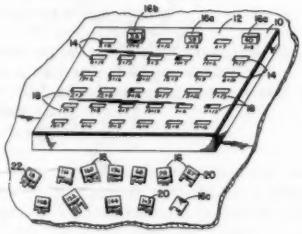
COMBINATION SYSTEM AND QUESTION AND ANSWER MATCHING GAME

Don J. Lurito, Box 181, MIT Branch, Cambridge, Mass. 02139

Filed Jan. 13, 1984, Ser. No. 570,613

Int. Cl.³ G09B *1/10*

U.S. Cl. 434—340 **10 Claims**



10. A matching game comprising:

a gameboard having a plurality of receivers, and

a plurality of plugs each insertable in any one of said receivers of said gameboard,

each of said receivers having an indicia associated with it and each of said plugs likewise having an indicia associated with it, said indicia of said receivers being different from one another, said indicia of said plugs being different from one another, and said indicia of said receivers and said indicia of said plugs being so related that the indicia of each receiver matches the indicia of a respective one of said plugs with a "question-correct answer" relationship,

each of said plugs having a plurality of prongs all extending in the same direction relative to the plug and each terminating in a forward end wall,

each of said receivers having a number of zones equal in number to the number of prongs of each of said plugs and each of which zones receives a respective one of said prongs of a plug when a plug is inserted into a receiver, and each of said zones having an end wall engageable with the end wall of a prong received therein provided the prong has sufficient length,

said prongs of each plug being length coded according to the rules:

(a) the length of each prong is nL, where L is a unit of length and n is an integer chosen from the set 0 to X, and

(b) the sum of the length of all of the prongs of the plug is equal to a constant K,

the prong length code of each of said plugs being different from that of all other of said plugs,

said zone end walls of each of said receivers also being length coded according to the rules,

(a) the length of each zone from its said end wall to a given datum plane is nL, where L is said aforesaid unit of length and n is an integer chosen from said set 0 to X, and

(b) the sum of said lengths of all of said zones is equal to said constant K,

the length code of each of said receivers matching the prong length code of that plug which is associated with said receiver through the indicia associated with said prong and said receiver so that when the plug whose indicia matches with the indicia of a receiver is inserted in that receiver the prong length code of that plug will also match the end wall length code of the receiver.

4,526,551

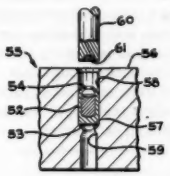
PRODUCTION OF ELECTRODES

Albert L. Hoffmanner, Worthington; Sheldon L. Semiatin, Columbus, and Richard S. Podiak, Maumee, all of Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio

Continuation-in-part of Ser. No. 154,884, May 30, 1980, abandoned, and Ser. No. 398,413, Jul. 14, 1982, abandoned, which is a continuation of Ser. No. 286,980, Jul. 27, 1981, abandoned, which is a continuation of Ser. No. 84,596, Oct. 15, 1979, abandoned. This application Nov. 2, 1983, Ser. No. 547,956

Int. Cl.³ H01T *21/02*

U.S. Cl. 445—7 **23 Claims**



1. A method of forming a bimetal center electrode, said method comprising forming a first metal into a cup having an open end, a closed end and a wall surrounding a central opening which extends a distance Z from the closed end to the open end, forming a right circular cylindrical core from a second and different metal, said core being sized to be received in the central opening in close fitting relationship with the wall therearound, and extending from the closed end toward the open end a distance less than Z, positioning said core in said central opening thereby forming a composite billet having first and second ends corresponding, respectively, with the open and closed ends of the cup, deforming the cup wall at the first end of the composite billet radially inwardly to close the cup wall at least partially around the right circular cylindrical core, extruding a portion of the composite billet, second end first, through an extrusion orifice of a die with a force applied to the first end of the composite billet by an end of a tool, said force being applied so as to maintain substantial contact between said core and said closed end of the cup while said extrusion is occurring.

4,526,552

ANIMATED FIGURE TOY HAVING A TELESCOPING APPENDAGE

Tony Rhodes, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 29, 1983, Ser. No. 566,743

Int. Cl.³ A63H *3/36*

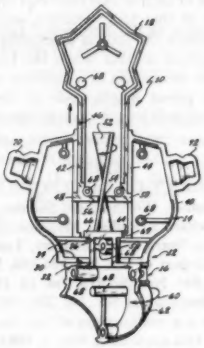
U.S. Cl. 446—320 **2 Claims**

1. In combination with a figure toy having an upper torso, a

lower torso and means rotatably connecting said lower torso to said upper torso, said upper torso being provided with a neck opening, the improvement which comprises:

an elongated neck movably mounted in said neck opening, said elongated neck including an upper and a lower end, said lower end of said neck normally extending to a position adjacent said lower torso and including a bottom wall having an elongated slot provided therein;

a figure toy head affixed to said upper end of said elongated neck; and



means coupling said torsos in said lower torso, said coupling means including a twisted blade engaged in said elongated slot and extending into said elongated neck, said twisted blade being affixed to said lower torso for rotation therewith, whereby said elongated neck is caused to move upwardly away from said lower torso and through said neck opening when said upper and lower torsos are rotated with respect to each other.

4,526,553

FLOPPY LIMBED WATER IMMERSIBLE FIGURE TOY

Benjamin G. Guerrero, Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Apr. 11, 1983, Ser. No. 483,464

Int. Cl.[3] **A63H** *3/46*

U.S. Cl. 446—380 **5 Claims**

1. In combination with a figure toy having a head, a torso, and a plurality of limbs, said figure toy being of the type which is immersible in water without water finding its way internally of said torso, said head, and said limbs, the improvement which comprises:

a plurality of unitary exterior limb connectors formed integrally with said torso during a molding operation using a water-impervious, elastic, polymeric material;

a plurality of limbs, each of said limbs being shaped to simulate the external appearance of a limb which is normally attached to the respective portion of said torso;

a cavity provided in each of said limbs, each of said cavities being shaped and sized to receive a respective limb connector with a relatively close fit, each of said cavities being formed integrally within said respective limb and having an open proximate end, an encompassing side wall and a closed distal end, the mass of each of said limbs being great compared to the size of said respective limb connector, whereby a limb and the connector to which it is attached will coact in the manner of a floppy limb on said figure toy;

means connecting each of said limbs to its respective connector;

said torso includes a neck opening at the upper end thereof, and wherein said head includes a neck opening at the lower end thereof, each of said neck openings including an annular flange having an upper edge and a lower edge, and wherein said figure toy includes:

a torso neck plug having an encompassing side wall, an open top and a closed bottom wall;

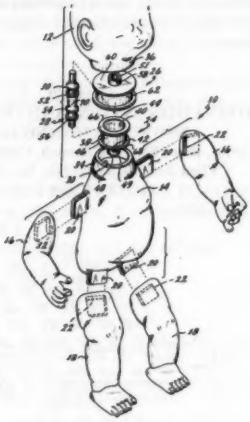
a first annular lip encompassing said open top on said torso neck plug;

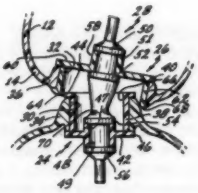
a second annular lip encompassing said open top on said torso neck plug;

a first hollow, cylindrical boss provided in said bottom wall portion of said torso neck plug, said first boss having an upper edge and a lower edge;

a head neckplug having an encompassing side wall, an open bottom and a closed top wall;

a third annular lip encompassing said open bottom on said head neck plug;





a fourth annular lip encompassing said top wall on said head neck plug;

a second hollow, cylindrical boss provided in said top wall portion of said head neck plug, said second boss having an upper edge and a lower edge, said lower edge of said second boss being flush with said top wall portion of said head neck plug; and

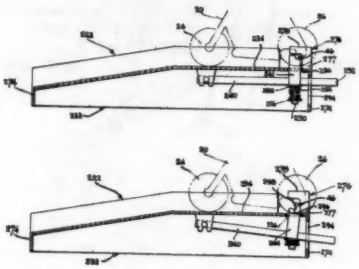
an elongated connector for connecting said head neck plug to said torso neck plug in a manner such that water is prevented from entering said head through said second boss and said torso through said first boss, said first and second annular lips engaging said annular flange on said torso and said third and fourth annular lips engaging said annular flange on said head with a sufficiently tight fit that water will not enter said torso and said head between said neck plug and said annular flanges.

4,526,554

TOY MOTORCYCLE AND LAUNCHER APPARATUS

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Delmar K. Everitt, Woodland Hills, Calif., assignors to Adolph E. Goldfarb, Westlake Village, Calif.

Continuation-in-part of Ser. No. 233,825, Feb. 12, 1981, Pat. No. 4,363,186. This application Feb. 10, 1982, Ser. No. 347,453
The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.
Int. Cl.³ A63H *29/00*
U.S. Cl. 446—429 **17 Claims**



1. Toy vehicle play apparatus comprising:

(a) a wheeled toy vehicle having:

a frame,

connection means including a projection fixed on the frame, at each side of the toy vehicle, and

at least one ground-engaging drive wheel rotatably mounted on the frame;

(b) a launcher having:

a platform,

control means for releasably supporting and holding the vehicle on the platform with the drive wheel out of engagement with the platform so that the drive wheel can rotate freely, for imparting rotation to said drive wheel, and for releasing the vehicle and allowing the drive wheel to engage the platform to propel the vehicle forwardly,

the control means comprising fixed abutment means on the platform defining at least one forwardly facing reaction surface, the abutment means comprising a spaced-apart pair of abutment members each engageable with one of the projections of the vehicle connection means,

the control means further comprising generally vertically movable retaining means on the platform, at each side of the toy vehicle when the toy vehicle is held on the platform, for engaging the respective projections of the vehicle connection means to elevate the drive wheel out of engagement with the platform and to support and hold the vehicle while rotation is being imparted to the drive wheel,

said movable retaining means comprising a pair of fingers each aligned with one of said abutment members, each associated pair of said fingers and of said abutment members being arranged and configured to cooperatively support and hold one of said projections,

the control means also comprising hand-movable rotation-imparting means engageable with the vehicle energy-storing drive mechanism and operable to urge the toy vehicle rearwardly against the reaction surface while imparting rotation to said mechanism,

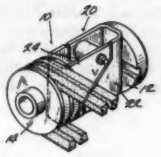
the movable retaining means being separately and selectively manually operable to disengage from the connection means on the vehicle and allow the rotating drive wheel to engage the platform for launching of the toy vehicle.

4,526,555

DRIVE COUPLING ASSEMBLY

Loren F. Hansen, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 25, 1983, Ser. No. 488,269
Int. Cl.³ F16D *3/00, 3/60*
U.S. Cl. 464—149 **11 Claims**



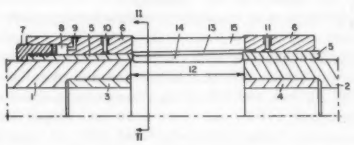
1. A drive coupling assembly for drivingly connecting together a drive member mounted for rotation about a first axis and a driven member mounted for rotation about a second axis generally coaxial with the first axis, said drive coupling assembly including a first torque transmitting member adapted for connection to the drive member for common rotation therewith and having a first connection portion radially spaced from the first rotational axis and extending axially toward the driven member, a second torque transmitting member adapted for connection to the driven member for common rotation therewith and having a second connection portion radially spaced from the second rotational axis and extending axially toward the drive member in radially spaced relationship with said first connection portion, a resilient member extending between said first and second connection portions transversely of the rotational axes and having opposite ends, and means fixedly mounting the opposite ends of said resilient member on said first and second connection portions at locations radially spaced from the rotational axes so that torque is transmitted from the drive member to the driven member through said resilient member.

4,526,556

DEVICE FOR CONNECTING TWO SHAFTS

Staffan Sundberg, Hofors, and Göte Jonsson, Hedemora, both of Sweden, assignors to SKF Steel Hofors AB, Sweden

Filed Mar. 7, 1983, Ser. No. 472,653
Claims priority, application Sweden, Jun. 1, 1982, 8203362
Int. Cl.³ F16D *1/06*
U.S. Cl. 464—182 **4 Claims**



1. A device for releasably connecting two shafts, the ends of which are spaced at a predetermined axial distance from one another, comprising an elongated inner clamping sleeve circumscribing and overlying an end portion of each of said shafts and having a tapered outer peripheral surface, an elongated outer clamping sleeve circumscribing said inner sleeve and having a bore with a tapered surface complementing and cooperating with the tapered outer peripheral surface of said inner sleeve, means for effecting axial displacement of said inner and outer clamping sleeves relative to one another, means for supplying a pressure medium between the confronting comple-

mentary engaging tapered surfaces of said sleeves, and means defining a circumferentially extending annular recess in at least one of the confronting surfaces of one of said sleeves having an axial dimension at least equal to and surrounding the axial distance between the axial end faces of the shaft members.

4,526,557

METHOD AND APPARATUS FOR CONTROLLING A CONTINUOUSLY VARIABLE TRANSMISSION

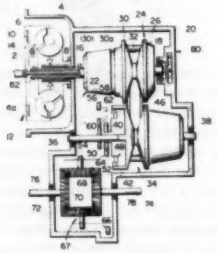
Yoshikazu Tanaka, Yokohama; Hiroyuki Hirano; Keiju Abo, both of Yokosuka; Haruyoshi Kumura, Yokohama; Sigeaki Yamamuro, Zushi, and Yoshiro Morimoto, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 19, 1983, Ser. No. 496,255

Claims priority, application Japan, May 20, 1982, 57-83926

Int. Cl.³ F16H *11/06, 47/00;* **B60K** *41/14, 41/22*

U.S. Cl. 474—18 **12 Claims**



1. A method for controlling an automotive vehicle including an engine and a continuously variable transmission which includes a hydrodynamic device having an input element drivingly connected to the engine and an output element, a drive pulley drivingly connected to the output element, a driven pulley, the V-belt running over the drive and driven pulleys, and a lock-up clutch engageable to mechanically connect the input element with the output element, the transmission being shiftable between different reduction ratios and having a shift motor which is movable to different positions for effecting shifting to different reduction ratios, the method comprising:

detecting a demand for a rapid acceleration wherein a rapid down shift is needed and generating a rapid down shift need indicative signal; and

disengaging the lock-up clutch in response to presence of said rapid down shift need indicative signal so as to allow the engine to increase its revolution speed during the down shift.

6. An apparatus for controlling a continuously variable transmission of an automotive vehicle having an internal combustion engine, the transmission including a hydrodynamic device having an input element and an output element, a drive pulley, a driven pulley, a V-belt running over the drive and driven pulleys, and a lock-up clutch engageable to mechanically connect the input element to said output element, the transmission being shiftable between different reduction ratios, the apparatus comprising:

means including a shift motor movable to different positions for shifting the transmission to different reduction ratios corresponding uniquely to said positions;

means for detecting a demand for a rapid acceleration wherein a rapid down shift is needed and generating a rapid down shift need indicative signal; and

means for disengaging the lock-up clutch in response to presence of said rapid down shift need indicative signal to allow the engine to increase its revolution speed during the down shift.

4,526,558

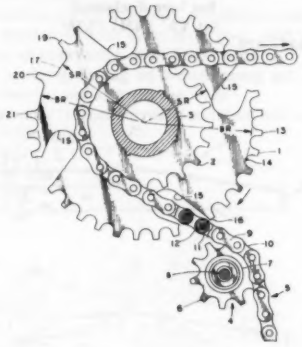
CHAIN ENGAGEMENT SLOT FOR BICYCLE SPROCKETS

Roger O. Durham, 1370 Thompson St., Glendale, Calif. 91201

Filed Nov. 3, 1983, Ser. No. 546,163

Int. Cl.³ F16H *55/30*

U.S. Cl. 474—152 **4 Claims**



1. In a bicycle having a drive chain and at least two spaced-apart, coaxially mounted sprockets, said sprockets having teeth with arcuate roller seats, said roller seats being tangent to a bottom radius originating at the center of said sprockets, said bicycle also having a laterally-adjustable guide means adaptable for guiding said drive chain onto one or the other of said sprockets, said guide means also adapated for causing said drive chain to shift from one of sid sprockets to the other, a chain engagement slot formed in at least one of said sprockets, said chain engagement slot extending to a lesser radius than the bottom radius of said bicycle sprocket, said chain engagement slot adapted for receiving said drive chain and allowing said drive chain to be aligned with said teeth of said sprocket, whereby said drive chain is caused to engage a tooth of said sprocket and to seat itself on said sprocket.

4,526,559

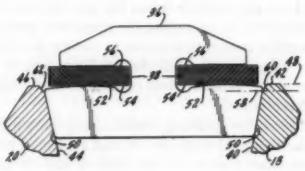
TENSION-TYPE BELT/PULLEY SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Richard L. Smirl, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 247,490, Mar. 25, 1981, abandoned. This application Feb. 14, 1984, Ser. No. 579,923

Int. Cl.³ F16G *1/00*

U.S. Cl. 474—201 **7 Claims**



1. A tension-type belt/pulley system comprising a plurality of variable pulleys, and a tension-type belt coupling said pulleys, each pulley including surface means for gripping said belt in a torque-transferring relationship, said surface means defining the pulley-cone, rim means defining the maximum operating pulley cone radius, and bevel means joining the outer extremity of said surface means with said rim means, said belt including a plurality of struts, and endless band means guiding

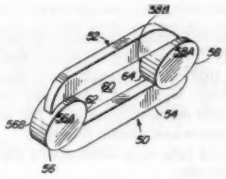
said struts, said band means having operating inner and outer radii, said system being constructed and arranged such that the maximum operating outer band radius is greater than the maximum operating pulley cone radius.

4,526,560

POWER TRANSMISSION CHAIN AND LINK THEREFOR

James C. Swain, Upper Arlington, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 11, 1983, Ser. No. 540,240
Int. Cl.³ F16G *1/21*
U.S. Cl. 474—242 **9 Claims**



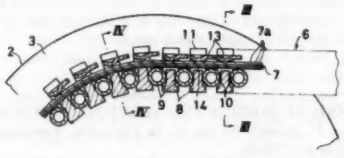
1. An endless power transmission chain comprising a plurality of unitary, one piece link and pivot members, the improvement wherein each of said members has a web portion and a pair of spaced pivot-surface means integral with said web portion, said web portion being of a thickness less than that of said pivot surface means, said web portions and pivot surface means collectively defining an open space.

4,526,561

V-BELT TRANSMISSION APPARATUS

Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1984, Ser. No. 589,286
Claims priority, application Japan, Mar. 14, 1983, 58-40784; May 23, 1983, 58-89083
Int. Cl.³ F16G *5/00, 1/22*
U.S. Cl. 474—242 **6 Claims**



1. A V-belt assembly for use in a V-belt transmission, said V-belt assembly comprising:

(a) endless belt means having a plurality of endless layers, wherein the thickness of each said layer is less than the thickness of the adjacent outer layer;

(b) a plurality of V-shaped members, each V-shaped member having a belt engaging surface; and

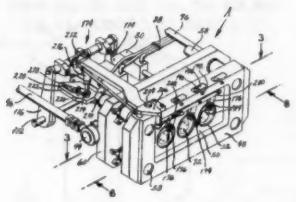
(c) intermediate members disposed between adjacent V-shaped members.

4,526,562

MACHINE AND PROCESS FOR PRODUCING INSERTS HAVING FOLDED PULL TABS

David S. Knudsen, and James D. Knudsen, both of 3145 Hawthorne Blvd., St. Louis, Mo. 63104

Filed Apr. 5, 1982, Ser. No. 365,338
Int. Cl.³ B31B *1/90*
U.S. Cl. 493—80 **18 Claims**



1. A machine for inserting a flexible insert having a tab along its periphery into container lid, with the tab folded over the main portion of the insert, said machine comprising: a die having a die opening; means for holding a lid opposite the die with the portion of the lid that is to receive the insert being exposed to the die and aligned with the die opening; a punch aligned with and configured to fit into the die opening; means for moving the punch into and out of the die opening from the side of the die opposite to the one to which the lid is exposed: means for positioning a sheet of flexible material between the die and punch, whereby the punch will blank an insert from the sheet when it moves through the sheet and into the die opening; a plunger supported by the punch and having a head that is capable of moving from a position within the punch to a position beyond the punch; means for moving the plunger such that its head moves out of the punch after the punch enters the die opening and such that the head thereafter moves into a lid held by the means for holding a lid; folding means carried by the plunger for folding the tab forwardly in the direction of plunger advance and over onto the remaining portion of the insert as the plunger head moves out of the punch and toward the means for holding a lid; and holding means for holding the insert against the plunger along the periphery of the insert and on each side of the tab as the folding means folds the tab forwardly, whereby the insert will fold along a line that is in effect a continuation of the periphery for the main portion of the insert and will thereafter be deposited in the lid with the tab folded back over the remaining portion of the insert.

4,526,563

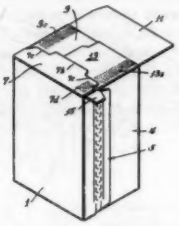
FOLDING ICE-CREAM CARTON, CARTON BLANK AND METHOD

Thomas W. Froom, Pittsford, N.Y., assignor to Rendoll Paper Corporation, Rochester, N.Y.

Division of Ser. No. 331,557, Dec. 17, 1981, Pat. No. 4,431,129, which is a division of Ser. No. 158,167, Jun. 10, 1980, Pat. No. 4,328,656, which is a division of Ser. No. 842,747, Oct. 17, 1977, Pat. No. 4,239,115. This application Sep. 8, 1983, Ser. No. 530,367
Int. Cl.³ B65B *43/08, 43/26*
U.S. Cl. 493—151 **16 Claims**

1. A method for closing an end of a carton tube formed of front, rear, cover, and bottom panels fastened together into a tube by means of a front cover flap fastened to the front panel, having respectively connected to said panels and said front cover flap, by fold lines, front and rear panel inner end wall-forming flaps, one of which is adapted to overlie the other when they are folded in; a side cover flap having a tuck-in tab projecting from the mid-portion thereof, which side cover flap is adapted, when it is folded in, to overlie the overlying inner end wall-forming flap; a bottom panel flap adapted, when

folded in, to overlie the tuck-in tab of the side cover flap; and, a glue-flap extension of the front cover flap adapted, when folded in, to overlie the folded-in side cover flap, which method comprises folding in one of the inner end wall-forming flaps, folding in the other inner end wall-forming flap so that it overlies the one already folded in, folding in the side cover flap thereover, applying strips of glue along and adjacent the fold lines between the folded-in inner end wall-forming flaps and



the panels to which they are connected, the glue strip adjacent the rear panel being terminated short of the folded-down side cover flap and being disposed between the tuck-in tab and the rear panel, and the other glue strip extending up over the folded-down side cover flap between the tuck-in tab and the front panel, and then folding the outer end wall-forming flap and the glue-flap extension in into contact with said glue strips and causing them to adhere thereto without a mandrel.

4,526,564

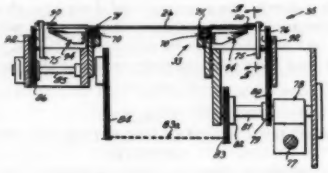
FLAP SEPARATOR FOR A CARTONING MACHINE

Charles C. Hughes, Villa Hills, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Jun. 24, 1983, Ser. No. 508,345

Int. Cl.³ B31B *1/76*; B65B *43/00*

U.S. Cl. 493—183 **4 Claims**



1. In a cartoning machine, a flap separator comprising,

a conveyor for continuously conveying flat folded cartons with the end flaps projecting laterally from the carton, said end flaps including upper and lower major flaps and upper and lower dust flaps between said upper and lower major flaps,

a support rotatably mounted adjacent said conveyor,

a pin mounted on said support and projecting toward said conveyor for engagement with said flaps,

means for timing said rotatable support to said conveyor to cause said pin to engage said flaps and bend a lower major flap downwardly,

a plow downstream of said support to capture only said lower major flap and hold it down

and means for erecting said carton while said lower major flap is held under said plow.

4,526,565

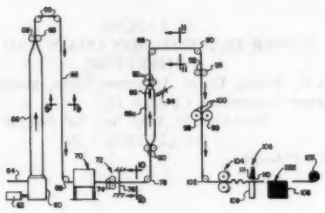
METHOD OF MAKING FLAT BOTTOM PLASTIC BAG

John E. Hummel, and William E. Baab, both of Tulsa, Okla., assignors to Linear Films, Inc., Tulsa, Okla.

Filed Feb. 23, 1983, Ser. No. 469,028

Int. Cl.³ B31B *35/00*

U.S. Cl. 493—196 **11 Claims**



1. A method of forming a plurality of flat bottom bags from a continuously formed tube of plastic film, said bags being formed such that when opened have opposed longitudinal sidewalls and end walls and a generally rectangular integral bottom wall, said method comprising the steps of:

forming a continuous plastic film tube;

collapsing said tube to a substantially flat band having opposed sidewalls;

passing said tube through means for forming at least one continuous longitudinal band seal;

slitting said tube along said at least one band seal to form at least two continuous tubes each having at least one longitudinal heat sealed seam;

passing said tubes through pleat forming guides wherein said tubes each are folded along opposed longitudinal fold lines to form pairs of opposed longitudinal inwardly folded pleats between said sidewalls;

providing a pair of opposed dies associated with each pair of pleats of a tube and an anvil plate insertable between opposed ones of said pleats of each pair of pleats on each of said tubes;

passing said tubes between said dies while inserting an anvil plate between opposed ones of said pleats of each pair of pleats on each of said tubes and between said dies, and causing said dies to be pressed against said anvil plates to heat seal a portion of each of said sidewalls to said pleats, respectively, along respective diagonal lines extending toward respective ones of said longitudinal fold lines;

heat sealing said sidewalls of each of said tubes along a transverse line at the convergence of respective pairs of diagonal lines with said longitudinal fold lines to form a center seam of said bottom wall and to form opposed triangular gussets of said bottom wall; and

cutting said tubes adjacent said center seam to define the bottom end of one bag and the top end of another bag formed of each of said tubes.

4,526,566

CONICAL BOBBIN AND METHOD OF FORMING SAME

Jean P. Briand, 53 rue de la Papeterie, Fontaine-les-Luxeuil, France (70800)

Filed May 24, 1982, Ser. No. 381,741

Claims priority, application France, May 27, 1981, 81 10650

Int. Cl.³ B31C *7/02*

U.S. Cl. 493—296 **18 Claims**

1. A process for the manufacture of a cone-shaped bobbin for use in the winding of textile threads or the like comprising the steps of cutting of a web of paper or cardboard into blanks having a predetermined shape which when wound on a forming mandrel provides a helical arrangement in which the large end of the cone thus formed contains a larger number of layers of the blank than does the small end of the said cone and then

winding the blank onto a forming mandrel to form a cone having a greater number of layers of the blank in its large end

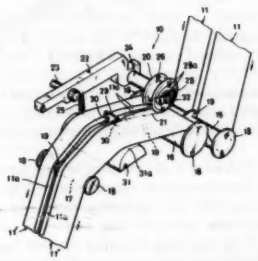
than its small end while simultaneously adhesively securing the layers to each other.

4,526,567

APPARATUS FOR MANUFACTURING PAPER STRINGER TAPE FOR SLIDE FASTENER

Kazuo Yokoe, and Yukio Sekine, both of Kurobe, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 27, 1982, Ser. No. 382,786
Claims priority, application Japan, May 28, 1981, 56-78710
Int. Cl.³ B31F *1/18*
U.S. Cl. 493—381 **2 Claims**



2. An apparatus for manufacturing a pair of paper stringer tapes for slide fasteners from a pair of blank paper strips of a continuous length, comprising:

(a) a frame;

(b) a guide roller assembly supported by said frame;

(c) means for feeding the pair of blank paper strips lengthwise in horizontally spaced relation to each other through said guide assembly;

(d) a pair of parallel spaced scoring wheels normally urged toward one guide roller of said guide roller assembly for scoring a pair of continuous prospective folding lines of a constant depth, one on each blank paper strip, immediately adjacent longitudinal margins of the spaced strips while the blank paper strips are passed between said one guide roller and the respective scoring wheels, said one guide roller having a pair of outer flanges, the diameter of said one guide roller increasing from said outer flanges enabling said paper strips to engage said flanges, by which the distance from the outer edge of the strip to the prospective score line is held constant in spite of any variation in the width of the paper strip; and

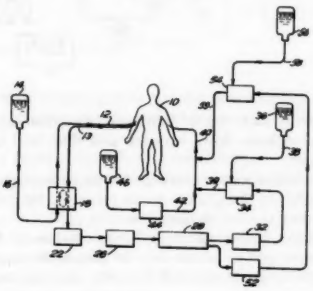
(e) means disposed downstream of said one guide roller and having a portion for projecting between the spaced strips and for folding one longitudinal margin of each paper strip on said folding line while the scored paper strip is moved past said folding means to provide spaced single margins of double thickness, each having a folded edge confronting the other folded edge on each of which a row of interengagable coupling elements for slide fasteners is to be mounted.

4,526,568

DIAGNOSTIC METHOD AND APPARATUS FOR CLAMPING BLOOD GLUCOSE CONCENTRATION

A. H. Clemens, Elkhart, Ind., and David L. Hough, Edwardsburg, Mich., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 29, 1982, Ser. No. 426,983
Int. Cl.³ A61M *5/00*; A61B *5/00*
U.S. Cl. 604—4 **3 Claims**



1. A diagnostic method for clamping the blood glucose concentration of a subject at any one of a plurality of levels, comprising the steps of: selecting a desired clamping level (BC); periodically determining the value of the present blood glucose concentration (GY) in the bloodstream of the subject; and introducing dextrose into the bloodstream of the subject at a rate (DR) derived in accordance with

$$DR = WT\left[\left(\frac{BC - GY}{3 + M}\right) KS + RC\right]$$

wherein:

DR=dextrose infusion rate for clamp (mg/min)

WT=body weight (kg)

BC=desired clamp level (mg %)

GY=present blood glucose level, corrected to fit a least squares regression line (mg %)

M=slope of the least squares regression line fit for the last five glucose values

KS=constant to allow adjustment for differences in metabolism

$$RC = .9RC_{Last} + .1\left(\frac{DR_{Last}}{WT}\right)$$

(glucose utilization in mg/kg/min).

4,526,569

PORTABLE DEVICE FOR INFUSING INSULIN ON THE BASIS OF GLYCEMIC MEASUREMENTS

Luigi Bernardi, Via Renato Fucini 246, 00137 - Rome, Italy

Filed Nov. 3, 1982, Ser. No. 438,785
Claims priority, application Italy, Nov. 4, 1981, 49638 A/81
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—4 **10 Claims**

1. A portable device having a circuit for blood drawing and re-immission, said circuit comprising:

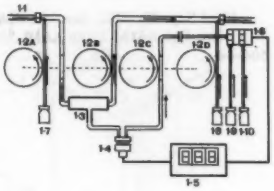
(a) means for drawing blood from a patient into the circuit;

(b) a filter connected to said means for drawing blood, said

filter being permeable only to the water and microsolutes of the drawn blood such that said water and microsolutes pass through the filter whereas other constituents of the drawn blood including cells, proteins and other macromolecules do not pass through the filter;

(c) a glucose sensor connected to said filter for receiving said water and microsolutes;

(d) means for connecting said glucose sensor to said filter



directly such that no substance other than said water and microsolutes flows between said filter and said glucose sensor;

(e) a microprocessor connected to said glucose sensor which resonds to the glucose levels measured by said sensor by sending control signals; and

(f) means connected to said microprocessor for infusing glucose and or insulin into the patient in response to said control signals received from the microprocessor.

4,526,570

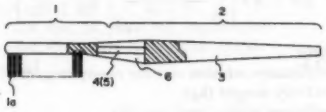
DENTAL HYGIENIC DEVICE

Yoshinori Nakagawa, Nara; Tsutomu Yoneda, Kishiwada, and Shoji Matsuda, Osaka, all of Japan, assignors to Shiken, Ltd., Osaka, Japan

Filed Oct. 25, 1982, Ser. No. 436,436

Int. Cl.³ A46B *15/00*; A61N *1/30*

U.S. Cl. 604—20 **10 Claims**



1. A dental hygienic device for the hygienic treatment of teeth in an oral cavity, said device comprising a main body having an insertion portion adapted to be brought into an operative position relative to water and/or saliva in the oral cavity, and semiconductor means consisting essentially of an n-type semiconductor material having a photoelectric effect, said semiconductor means including at least one portion disposed relative to said insertion portion so as to be simultaneously exposable to light and operatively communicable with the water and/or saliva of the oral cavity, said semiconductor means, in response to irradiation by light, for establishing at said one portion an electron density differential between said teeth and said semiconductor means to cause a reduction to occur at said teeth to thereby hygienically treat said teeth.

4,526,571

CURVED ULTRASONIC SURGICAL ASPIRATOR

David G. Wuchinich, New York, N.Y., assignor to Cooper LaserSonics, Inc., Santa Clara, Calif.

Filed Oct. 15, 1982, Ser. No. 434,567

Int. Cl.³ A61B *17/20*

U.S. Cl. 604—22 **12 Claims**

1. Ultrasonic surgical aspirator apparatus for breaking apart and removing tissue from a recessed operative site, comprising,

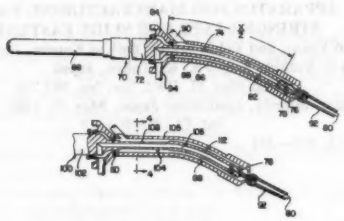
transducer means operable to convert high frequency electrical energy to high frequency mechanical vibrations,

elongated straight probe means having an axial bore extending therethrough,

elongated vibration transmitting means having an enlarged body portion at one end operably connected with said transducer means and an elongated slender body portion at its other end operably associated with said probe means whereby longitudinal vibrations produced by said transducer means are transmitted to said probe,

an elongated handpiece supporting said transmitting means and enclosing said transducer means,

said elongated slender body portion of said transmitting means projecting outwardly from one end of said elongated handpiece and being curved along at least a portion of its length at a location spaced from said handpiece, the curvature of said slender body portion being the arc of a circle having a radius R of sufficient length to satisfy the condition $R \geqq 0.7\lambda$, where λ is the length of the longitudi-



nal vibration wave transmitted and wherein the length of said elongated body portion is at least equal to one-half the wave length of the vibrations produced by said transducer means,

said elongated slender body portion having an axial passage extending therethrough in communication with said axial bore in said probe for aspirating fluid and tissue therethrough from the operative site; and

an irrigation fluid housing mounted on said handpiece and extending in parallel surrounding relation to and cooperating with said slender body portion to define an irrigation fluid passage for conducting irrigation fluid to be discharged adjacent the free end of said probe, and wherein said transducer is operable to generate a standing wave pattern in said transmitting means, said standing wave pattern including at least one node in said slender body portion adjacent said other end, said elongated probe being rigidly attached to said slender body portion substantially at a vibration node.

4,526,572

MEDICAL CONNECTOR

Jeremy F. Donnan, and David A. Reed, both of Nottinghamshire, England, assignors to The Boots Company PLC, Nottingham, England

Filed Jun. 29, 1983, Ser. No. 509,124

Claims priority, application United Kingdom, Jun. 30, 1982, 8218860

Int. Cl.³ A61M *5/00*; F16L *27/10*

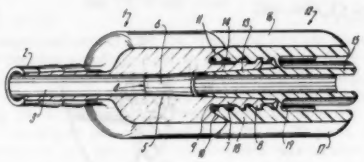
U.S. Cl. 604—29 **5 Claims**

1. A connector for medical tubing comprising

(a) a first part which has means for releasably connecting the first part to a second part of the connector and which has a central projection having a flared axial bore and a contact zone around the base of the central projection, and

(b) a second part which has means which are engagable with the connecting means on the first part for releasably connecting the first and second parts, a tapered axial projection which fits inside the flared bore of the first part to

provide a fluid-tight seal when the parts are interconnected and an outer wall which surrounds the tapered projection and which is connected to the tapered projection by a flexible membrane which allows relative axial movement between the outer wall and the tapered projection, when the tapered projection of the second part is in sealing contact with the flared bore of the first part, from a position in which the forwardmost end of the outer wall of the second part is spaced from the contact zone to a position in which the forwardmost end of the outer wall of the second part is in sealing contact with the contact zone.



4,526,573

SUCTION-IRRIGATION EQUIPMENT WITH CONTROL VALVE

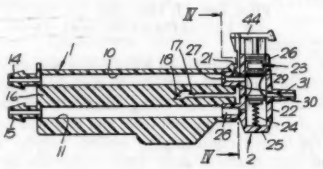
Graham G. Lester, Folkestone; Peter J. Brand, Hythe, and Graham Deane, Ascot, all of England, assignors to Smiths Industries Public Limited Company, London, England

Filed Mar. 21, 1983, Ser. No. 477,550

Claims priority, application United Kingdom, Mar. 29, 1982, 8209131

Int. Cl.³ A61M 1/00

U.S. Cl. 604—33 **9 Claims**



1. Suction-irrigation equipment comprising a substantially rigid handle formed as a first unit, said first unit being an integral one-piece plastics molding, said molding having first and second tubular formations extending along the handle that are linked along their length by an integral land between said tubular formations, said tubular formations defining respective first and second bores extending therethrough, said unit having first and second projections at one end in communication respectively with said first and second bores, said projections being adapted for insertion within respective bores of flexible tubing connected to a suction source and a source of irrigating fluid, valve means formed as a second unit, said valve means having a valve housing and a valve member, said housing having an outlet port and first and second inlet ports, said valve member being displaceable within said housing to connect said first or second inlet ports to said outlet port, means connecting the other end of said first unit with said valve housing so that said first and second inlet ports communicate with said first and second bores respectively, and the said other end of said first unit having a gap in the said land to enable the ends of said tubular formations adjacent said other end of said first unit to be flexed towards or away from one another to facilitate connection of said first unit with said valve housing.

4,526,574

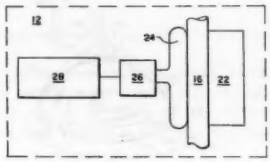
DIFFERENTIAL OCCLUSION SENSING METHOD AND APPARATUS

Michael O. Pekkarinen, Lincolnshire, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 23, 1983, Ser. No. 497,369

Int. Cl.³ A61M 5/00

U.S. Cl. 604—52 **15 Claims**



1. A method of sensing and monitoring downline fluid pressure in a fluid infusion system, comprising:

providing a fluid tubing;

providing a positive fluid flow in said tubing;

sensing an initial base operating location of a single portion of said tubing;

monitoring the tubing portion location;

comparing the monitored location against the initial base operating location; and

setting an alarm if said monitored location exceeds a predetermined location differential.

4,526,575

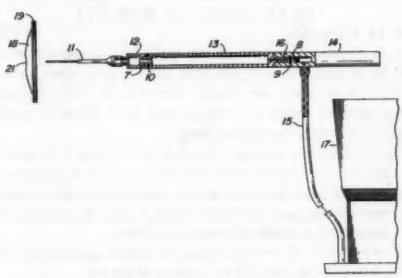
HYDROPROPULSION CATHETER AND METHOD FOR REMOVING URINARY BLOCKAGES

Conrad Roblejo, 23 Acorn Hill Dr., Voorhees, N.J.

Filed Sep. 30, 1982, Ser. No. 428,877

Int. Cl.³ A61M 5/00

U.S. Cl. 604—54 **8 Claims**



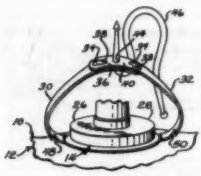
6. Method of removing urinary blockages in small male animals comprising inserting an non-traumatic needle in the urethra of the animal, and then introducing pulsating liquid through the needle, thereby immediately dislodging the blockage.

4,526,576

LIQUID DRAINAGE SYSTEM WITH INTERLOCKED HANDLE

James P. Cianci, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jan. 27, 1983, Ser. No. 461,351
Int. Cl.[3] A61M 1/00
U.S. Cl. 604—322 2 Claims



1. A liquid drainage system, comprising:

a receptacle having a chamber for collection of liquid therein;

a housing secured to an upper portion of the receptacle and having opposed ends, said housing having a pair of opposed elongated flexible handle members extending from the housing ends, and means for interlocking outer ends of the handle members together with the handle members engaging each other to serve as a handle for the receptacle, wherein the handle members when interlocked have a pair of aligned openings adjacent said outer ends, and includes a hook member means which extends through said openings to hang the receptacle.

4,526,577

DISPOSABLE ARTICLE CONSTRUCTIONS

Robert C. Schmidt, Jr., Port Murray, and Paul P. Puletti, Glen Gardner, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jan. 9, 1984, Ser. No. 569,001
Int. Cl.[3] A61F 13/16; B32B 7/14
U.S. Cl. 604—366 14 Claims

1. A disposable article of the multi-line construction comprising at least one polyethylene or polypropylene substrate bonded to at least one tissue, non-woven, polyethylene or polypropylene substrate using a hot melt pressure sensitive adhesive composition comprising:

(a) 15 to 35% by weight of an A-B-A block or A-B-A-B-A-B multi-block copolymer containing at least 28 parts styrene per 100 parts polymer where polymer blocks A are styrene blocks and polymer block B (the B component) is butadiene or hydrogenated butadiene;

(b) 45 to 70% by weight of a compatible tackifying resin;

(c) 5 to 30% by weight of a plasticizing oil;

(d) 0 to 5% by weight of a petroleum derived wax; and

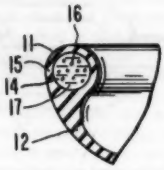
(e) 0.1 to 2% by weight of a stabilizer.

4,526,578

VAGINAL DIAPHRAGM

Patrick S. L. Wong, Hayward, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Filed May 16, 1983, Ser. No. 494,700
Int. Cl.[3] A61F 5/46
U.S. Cl. 604—892 25 Claims



1. A vaginal diaphragm adapted and sized for easy insertion and comfortable retention in a vagina, the vaginal diaphragm comprising: a tube member comprising a wall that surrounds an internal lumen, which tube member is united at its ends by an internal coupling member to define an annular internal reservoir, the wall of the tube member formed of a vaginally acceptable material that controls the rate of release of an active agent from the annular reservoir; a vaginally acceptable active agent formulation in the lumen; and, a dome-shaped film extended across the area encompassed by the annular reservoir, the film a flexible diaphragm secured to the annular reservoir and formed of a vaginally acceptable material.

4,526,579

METHOD FOR GRAFT COPOLYMERIZATION TO NATURAL RUBBER ARTICLES

Parviz R. Ainpour, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 17, 1983, Ser. No. 505,572
Int. Cl.[3] A61M 25/00; C08L 51/04
U.S. Cl. 604—265 16 Claims

1. A process for grafting a hydrophilic polymer of a carboxylic acid, or a salt thereof, onto the surface of a natural rubber article, said rubber article being selected from the group consisting of a sheet, glove and tube; and said acid being selected from the group consisting of maleic, acrylic, methacrylic, itaconic and citraconic acid; which comprises the steps of

(a) contacting said rubber article with from 2 to 45 parts by weight, per part by weight of said rubber article, of an anhydride of said carboxylic acid, and 0.4 to 10 percent, based on weight of said anhydride, of a free radical polymerization initiator, at a temperature of from 50° to 150° C., in the presence of a reaction inert organic solvent which dissolves at least substantial portions of said monomeric acid anhydride and said initiator, and has no significant detrimental effect on the starting rubber article or product;

(b) washing the resulting rubber article with a water miscible solvent to remove by-products and unreacted starting materials, followed by

(c) hydrolysis of the washed article under aqueous alkaline conditions to convert carboxylic acid anhydride groups to carboxylate salts, and when free carboxylic acid groups are desired, acidifying with dilute aqueous or alcoholic acid.

13. A natural rubber article selected from the group consisting of a sheet, glove and tube, having a hydrophilic surface when prepared according to the process of claim 1.

4,526,580

METHOD OF PREPARING COLLAGEN EXTRUSION GELS

Hubert B. Crooks, High Bridge, N.J., assignor to Devro, Inc., Somerville, N.J.

Filed Sep. 12, 1983, Ser. No. 531,137
Int. Cl.[3] C14C *1/00*
U.S. Cl. 8—94.18 7 Claims

1. An improved process for the treatment of hide corium used in preparing a collagen gel to be extruded to form an edible collagen sausage casing with improved clarity comprising contacting buffered hide corium with an aqueous solution containing 2% to 5% by weight of glycerine, 0.5% to 3% by weight of hydrogen peroxide and from 25 to 70 parts per million of ferrous ion, mixing the solution with hide corium for a period from three to 16 hours, removing the hide from the solution, washing the hide with water to remove the residual reactants from the hide.

4,526,581

PROCESS FOR PRODUCING LEATHER

William C. Prentiss, New Britain, and David N. Price, Norristown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 7, 1983, Ser. No. 464,236
Int. Cl.[3] C14C *3/22, 3/28*
U.S. Cl. 8—94.33 18 Claims

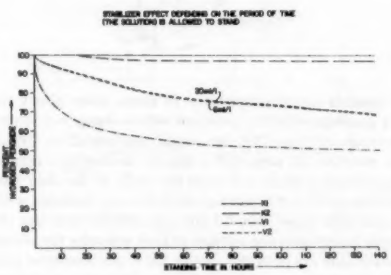
1. In a process for producing leather the use as a tanning agent of a copolymer comprising at least 60 mole percent of residues of methacrylic acid and at least about 5 mole percent of residues of at least one (C_1–C_4) alkyl acrylate, said copolymer having a weight average molecular weight from about 3500 to 9000.

4,526,582

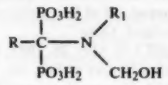
METHOD FOR BLEACHING CELLULOSE FIBERS WITH N-(HYDROXY METHYL)-1-AMINO ALKANE-1,1-DIPHOSPHONIC ACID STABILIZED PEROXIDE-CONTAINING BLEACHING BATHS

Hans-Adolf Rohlfs, Heidelberg; Alfred Kling, Ladenburg; Guenter Raab, Laudenbach; Michael Vogt, Moerlenbach; Viktor Specht, Dossenheim, and Ulrike Schaetzke, Weinheim-Sulzbach, all of Fed. Rep. of Germany, assignors to Benckiser-Knapsack GmbH, Ladenburg am Neckar, Fed. Rep. of Germany

Division of Ser. No. 374,683, May 4, 1982, which is a division of Ser. No. 177,885, Aug. 14, 1980, Pat. No. 4,337,214. This application Aug. 27, 1984, Ser. No. 635,200
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1979, 2933969
Int. Cl.[3] C07F *9/38;* D06L *3/02;* D21C *9/16*
U.S. Cl. 8—107 11 Claims



1. A method for bleaching cellulose fibers and blends thereof with synthetic fibers, comprising the step of bleaching said fibers with an alkaline, peroxide-containing bleaching liquor, wherein such a bleaching liquor contains, as a peroxide stabilizing agent, between about 4% and about 30% of an N-(hydroxy methyl)-1-amino alkane-1,1-diphosphonic acid corresponding to the formula



wherein

R represents hydrogen or alkyl with 1 to 3 carbon atoms, and

R_1 represents hydrogen or the hydroxy methyl group (—CH_2OH), and the water-soluble salts of said acid, said amount being calculated based on the content of 35% hydrogen peroxide present in the bleaching liquor.

4,526,583

POWDERED CARPET TREATING COMPOSITIONS

Anthony J. Gioffre, Ridgefield, Conn., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 8, 1983, Ser. No. 521,454
Int. Cl.[3] D06M *11/04;* C11D *17/00*
U.S. Cl. 8—137 24 Claims

8. In a dry carpet cleaning and deodorizing composition comprising about 85 to 99.8% by weight of hydrated sodium borate, about 0.2–15 percent by weight of water-insoluble hydrated metal aluminosilicate, 0.01 to 5 percent by weight perfume and 0.05 to 5 percent by weight of cationic quaternary ammonium salt, the improvement comprising treating the aluminosilicate with an effective amount of an anti-static agent prior to admixture with the hydrated sodium borate and perfume.

4,526,584

PROCESS FOR PUMPING A CARBONACEOUS SLURRY

James E. Funk, Alfred Station, N.Y., assignor to Alfred University Research Foundation, Inc., Alfred, N.Y.

Continuation-in-part of Ser. No. 375,183, May 5, 1982, Pat. No. 4,441,887, which is a continuation-in-part of Ser. No. 288,737, Jul. 31, 1981, Pat. No. 4,416,666, which is a continuation-in-part of Ser. No. 88,815, Oct. 26, 1979, Pat. No. 4,282,006, which is a continuation-in-part of Ser. No. 957,166, Nov. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,337, Apr. 25, 1977, abandoned. This application Apr. 13, 1983, Ser. No. 484,686
Int. Cl.[3] C10L *1/30*
U.S. Cl. 44—51 13 Claims

1. A process for transporting a carbonaceous material, comprising the steps of:

(a) providing a solids-liquid slurry, wherein:

1. said slurry has a pH of from about 5 to about 12,
2. said slurry comprises a consist of finely-divided particles of solid carbonaceous particles dispersed in said liquid,
3. said slurry is comprised of from about 64 to about 81 volume percent of said solid carbonaceous material and from about 19 to about 36 volume percent of carrier liquid,
4. said slurry has a Brookfield viscosity at a solids content of 70 volume percent, ambient temperature, ambient pressure, and a shear rate of 100 revolutions per minute, of less than 5,000 centipoise,
5. said consist has a specific surface area of from about 0.8 to about 4.0 square meters per cubic centimeter and an interstitial porosity of less than 20 volume percent, and
6. from about 5 to about 70 volume percent of said particles of solid carbonaceous material are of colloidal size, being smaller than about 3 microns; and

(b) pumping said solids-liquid slurry in the laminar flow regime at a Reynolds number of less than 2100.

4,526,585

BENEFICIATED COAL, COAL MIXTURES AND PROCESSES FOR THE PRODUCTION THEREOF

Lester E. Burgess; Karl M. Fox, both of Swarthmore, and Phillip E. McGarry, Palmerton, all of Pa., assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 267,773, May 28, 1981, Pat. No. 4,412,843, which is a continuation-in-part of Ser. No. 114,414, Jan. 22, 1980, Pat. No. 4,304,573. This application Jul. 22, 1983, Ser. No. 516,448

Int. Cl.[3] C10L *1/32*

U.S. Cl. 44—51 7 Claims

1. A beneficiated coal product comprising surface treated, hydrophobic and olephilic coal having a reduced ash content within the range of from about 0.5 to about 10% by weight based on the weight of dry coal.

4,526,586

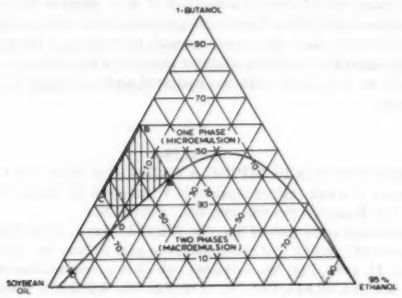
MICROEMULSIONS FROM VEGETABLE OIL AND AQUEOUS ALCOHOL WITH 1-BUTANOL SURFACTANT AS ALTERNATIVE FUEL FOR DIESEL ENGINES

Arthur W. Schwab, and Everett H. Pryde, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 24, 1982, Ser. No. 423,402

Int. Cl.[3] C10L *1/18*

U.S. Cl. 44—53 6 Claims



1. A nonionic hybrid fuel composition comprising:

(a) from about 40–65% by volume vegetable oil composed of vegetable triglycerides in which the preponderance of the fatty acid ester moieties have a chain length of 18 or more carbon atoms;

(b) a lower (C_1-C_3) alcohol;

(c) water, in an amount of at least about 0.1% by volume; and

(d) 1-butanol

wherein the ratio of the lower (C_1–C_3) alcohol:water is at least 4:1 and wherein said butanol is present in the fuel composition in an amount effective for said composition to exist as a thermodynamically stable microemulsion and the combined amount of lower alcohol, water, and 1-butanol relative to said vegetable oil is 35–60% by volume and is sufficient to impart to said composition a kinematic viscosity in the range of 2–9 centistokes at 37.8° C.

4,526,587

DEPOSIT CONTROL ADDITIVES-METHYLOL POLYETHER AMINO ETHANES

Curtis B. Campbell, Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 31, 1983, Ser. No. 499,131

Int. Cl.[3] C10L *1/22*

U.S. Cl. 44—73 10 Claims

1. A fuel composition comprising a major portion of hydrocarbon boiling in a gasoline range, and from 30 to about 10,000 ppm of hydrocarbyl methylol polyoxyalkylene amino ethane of molecular weight from about 300 to about 2500; wherein said hydrocarbyl group contains from 5 to about 30 carbon atoms, said polyoxyalkylene moiety comprises 1 to 30 oxyalkylene units selected from oxyalkylene units having from 2 to 4 carbon atoms, said ethane moiety contains from about 2 to about 8 carbon atoms and said amine moiety is a polyamine comprising from 2 to about 12 amine nitrogen atoms and from about 2 to 40 carbon atoms.

4,526,588

PROCESS FOR THE PRODUCTION OF A COAL-WATER SUSPENSION WHICH IS SUITABLE FOR USE IN COAL GASIFICATION UNDER ELEVATED PRESSURE

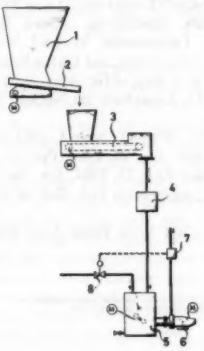
Jurgen Lusch, Oberhausen; Heinrich Heinen, Ottobrunn; Bernhard Lieder, Bottrop; Volkmar Schmidt, Oberhausen, and Wolfgang Kolodzey, Duisburg, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 238,883, Feb. 27, 1981, abandoned. This application May 6, 1983, Ser. No. 490,547

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1978, 2836440

Int. Cl.[3] C10J *3/02*

U.S. Cl. 48—202 11 Claims

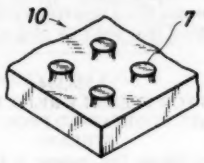


1. A process for the preparation of a coal water slurry suitable for gasification under pressure which comprises subjecting a mixture of 50 to 75% by weight coal and 25 to 50% by weight water to the action of a disc or toothed disc attrition mill or toothed colloid mill until the bulk of the coal has a particle size of 50 to 500 μm and until the coal particles which have a diameter larger than 0.5 mm accounts for less than 15% by weight based upon the amount of coal whereby the particle size distribution curve of the coal in the Rosin-Rammler particle size distribution grid according to DIN No. 4190 has a slope of $\geqq 1$, wherein thereafter coal gasification of the resultant composition is effected without changing the relative amount of coal or water in the slurry and wherein said process is performed without classifying, filtering or thickening the slurry.

4,526,589
POLISHER ELEMENT

Sachiko Ibata, Osaka, Japan, assignor to Nippon Tenshashi Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 402,675, Jul. 28, 1982, Pat. No. 4,456,500.
This application Apr. 13, 1984, Ser. No. 599,861
Claims priority, application Japan, Mar. 2, 1982, 57-33626
Int. Cl.[3] B24B 1/00
U.S. Cl. 51—295 4 Claims



1. A polishing element comprised of etchable metal stock and produced by a process whereby said metal stock has a plurality of recesses etched on a coarse surface thereof so as to form hardened cutting teeth, said process including the steps of:

depositing a photoresist film on said coarse surface of said metal stock;

using a photomask to selectively cover portions of said photoresist film;

removing portions of said photoresist film, thereby leaving portions of said metal stock coarse surface uncovered;

etching recesses in said uncovered portions of said metal stock coarse surface by applying an etchant while said metal stock and said etchant are in physical motion relative to each other, thereby forming cutting teeth having teeth tops lying essentially in the plane of said metal stock coarse surface and teeth sides which at least partially define said recess, the interior angle between said teeth top and teeth side being an acute angle;

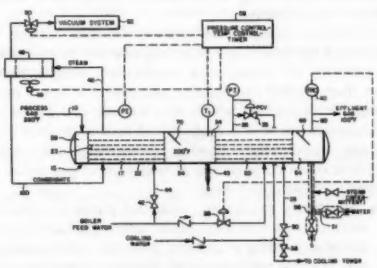
removing remaining portions of said photoresist film from said metal stock; and,

hardening said coarse surface portions of said metal stock on which said cutting teeth are formed.

4,526,590
COOLING AND CONDENSING OF SULFUR AND WATER FROM CLAUS PROCESS GAS

John W. Palm, Tulsa, Okla., and Lorenz V. Kunkel, Tyler, Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 31, 1983, Ser. No. 499,668
Int. Cl.[3] F28B 1/02; C01B 17/02
U.S. Cl. 55—27 5 Claims



1. A process for removing water from a Claus process gas stream containing vaporized sulfur, said process comprising:

passing said Claus process gas stream through a sulfur condenser and removing liquid elemental sulfur therefrom and then

(a) passing the resulting gas stream from said sulfur condenser through a first cooling zone maintained at such conditions, including temperature, so as to effect condensation and solidification of elemental sulfur without condensation of water;

(b) passing the resulting gas stream from said first cooling zone through a second cooling zone maintained at such conditions, including temperature, so as to effect condensation of water;

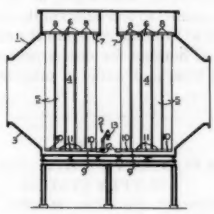
periodically increasing the temperature of said first cooling zone to melt solid sulfur accumulated therein; and

periodically increasing the temperature of said second cooling zone to melt solid sulfur accumulated therein.

4,526,591
ELECTRODE RAPPING ARRANGEMENT

Allan R. Getzin, Prospect, Ky., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 13, 1982, Ser. No. 449,471
Int. Cl.[3] B03C 3/76
U.S. Cl. 55—112 9 Claims



1. In an electrostatic precipitator having a flow-through housing and a pair of spaced opposing electrode assemblies with each assembly including a plurality of electrodes and an anvil connected with each of the electrodes aligned with anvils of the opposing electrode assembly, the improvement comprising an electrode rapping arrangement including:

a rotatably supported shaft extending horizontally across the interior of the housing between the opposing electrode assemblies equidistant from each of the assemblies;

drive means for rotating said shaft in either direction;

a crank mounted on the shaft aligned in a plane with each of the anvils;

said crank having an attachment portion and an outwardly opening hook portion;

an articulated linkage including a first arm having one end pivotally secured to said attachment portion and a second arm having one end pivotally secured to the other end of said first arm;

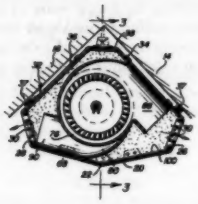
a hammer affixed to the other end of said second arm; and

said first and second arms defining lengths whereby rotation of the shaft in either direction causes the crank to draw the first arm into a position overlying the shaft and continued rotation of the shaft causes the first arm to lift the second arm in a fashion guiding the hammer into the hook portion of the crank which releases the hammer upon continued rotation of the shaft to allow the hammer to swing downwardly on the linkage into the anvil on one of the opposing electrode assemblies when the shaft is rotated in one direction and the anvil on the other opposing electrode when the shaft is rotated in the other direction.

4,526,592
AIR CIRCULATOR AND AIR FILTRATION DEVICE

Joseph M. Armbruster, 2700 NE. 47th St., Lighthouse Point, Fla. 33064

Filed Aug. 26, 1983, Ser. No. 526,828
Int. Cl.[3] B01D *50/00*; F24F *13/02*
U.S. Cl. 55—276 15 Claims

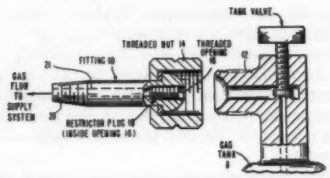


1. An air circulator for providing circulation of air substantially throughout the total area of a room comprising a housing supported vertically at a corner of the room intermediate the floor and ceiling with the housing including an air inlet at the upper end portion thereof and an air inlet at the lower end portion thereof, said housing including a rear wall extending alongside of the surfaces of the walls which intersect to form the corner of the room and an air outlet along each opposite side portion thereof for discharging air in a horizontal direction generally parallel to and adjacent the surfaces of the walls which intersect to form the corner of the room, blower means interiorly of the housing for discharging substantially equal volumes of air from each outlet at substantially equal velocities.

4,526,593
RESTRICTOR PLUG DEVICE WITH FILTER FOR A GAS SUPPLY SYSTEM

Bernard S. Meyerson, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,538
Int. Cl.[3] B01D *46/10*; F15D *1/02*
U.S. Cl. 55—385 R 1 Claim



1. A connector fitting structure adapted to be connected to a gas outlet device on a gas tank, said connector fitting having an internal opening along its central axis as a passage for gas from said gas storage tank, said internal opening of said connector fitting incorporating a recess having screw threads on the surface of said recess,

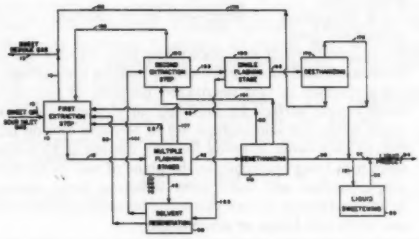
a cylindrical flow restrictor plug structure containing screw threads on the external cylindrical side surface thereof, said threads being constructed so as to mate with said thread within said connector fitting recess, said flow restrictor plug having an orifice therethrough extending from a first aperture in one end of said flow restrictor plug to a second aperture in the other end of said flow restrictor plug, said orifice in said cylindrical flow restrictor plug structure varying in diameter from a first larger diameter at said one end of said cylindrical flow restrictor plug structure to a second smaller diameter at said other end of said cylindrical flow restrictor plug structure, and

a cylindrical filter means positioned at the said one end of said flow restrictor plug against said first aperture therein wherein both said cylindrical flow restrictor plug structure and said cylindrical filter means are mounted in combination into said recess in said connector fitting structure, said cylindrical flow restrictor plug structure being screwed into said threaded recess in said connector fitting structure and said cylindrical filter means is disposed in said connector fitting structure recess against said one end of cylindrical flow restrictor plug structure.

4,526,594
PROCESS FOR FLEXIBLY REJECTING SELECTED COMPONENTS OBTAINED FROM NATURAL GAS STREAMS

Yuv R. Mehra, Odessa, Tex., assignor to El Paso Hydrocarbons Company, Odessa, Tex.

Continuation-in-part of Ser. No. 374,270, May 3, 1982, Pat. No. 4,421,535, and Ser. No. 507,564, Jun. 24, 1983, Pat. No. 4,511,381. This application Sep. 14, 1983, Ser. No. 532,005
Int. Cl.[3] F25J *3/02*
U.S. Cl. 62—17 47 Claims



1. In a continuous process for producing from an inlet natural gas stream a liquid hydrocarbon product of a selected composition, which is selectively adjustable to substantially any selected degree in accordance with market conditions, and a residue natural gas stream of pipeline quality that selectively includes ethane, propane, butanes, or propane plus butanes, said process comprising the following steps:

a. selectively extracting a stream of hydrocarbons that are primarily heavier than methane from said natural gas stream with a physical solvent; and

b. selectively rejecting a consecutively lowest molecular weight portion of said extracted stream, said rejected portion comprising, as its heaviest component, said propane or said butanes;

wherein, for all components heavier than said ethane, there exists a need for selectively rejecting any one or two selected hydrocarbons of consecutive molecular weight that are heavier than another recoverable and desirable lower molecular-weight hydrocarbon which may include said ethane,

an improvement which enables said process to provide said liquid hydrocarbon product comprising only selected hydrocarbon components of said natural gas stream, said improvement comprising:

A. selectively extracting, with said physical solvent in a second extraction step, hydrocarbons selected from the group consisting of ethane, propane, and butanes from said rejected portion of said step b to form a rich solvent stream;

B. flashing said rich solvent stream in at least one flashing stage to separate said selected hydrocarbons from said physical solvent; and

C. de-ethanizing said selected hydrocarbons to form:

(1) an overhead product comprising said recoverable

and desirable lower molecular-weight hydrocarbons, and

(2) a bottoms product comprising undesirable hydrocarbons.

4,526,595

PLANT FOR PRODUCING GASEOUS NITROGEN

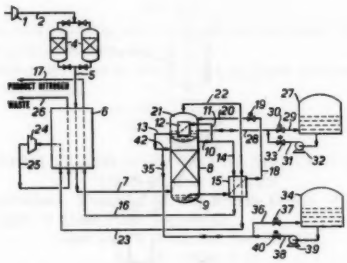
Brian A. McNeil, Surrey, United Kingdom, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 3, 1983, Ser. No. 538,256

Claims priority, application United Kingdom, Oct. 27, 1982, 8230740

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—28 **2 Claims**



1. A plant for producing gaseous nitrogen, which plant comprises means designed for enabling rapid variation in production rate while maintaining product quality, including a heat exchanger for cooling feed air, a distillation column for receiving at least part of said feed air, a vessel, a reflux condenser disposed in said vessel and arranged to receive, in use, vapour from said distillation column and return liquid reflux thereto, a line connecting the lower portion of said distillation column to said vessel and having an expansion valve mounted therein, a line for withdrawing nitrogen product from said distillation column and bringing said nitrogen product into heat exchange with said feed air, a crude liquid oxygen (LOX) storage tank communicating with said vessel, means to bring crude liquid oxygen from said crude LOX storage tank into heat exchange with vapour from said distillation column to provide reflux for said distillation column, a liquid nitrogen (LIN) storage tank communicating with said distillation column, means to return liquid nitrogen from said liquid nitrogen storage tank to said distillation column and/or vessel, a line for conveying waste gas from said vessel, means to warm said waste gas, an expander to expand said waste gas, means to control the flow of waste gas through said expander, and means to effect heat exchange between the expanded waste gas and the feed air.

4,526,596

PROCESS FOR RECOVERING BUTANE AND PROPANE FROM CRUDE GAS

Jean-Louis Baggio, Tremblay les Gonesse, and Patrice Sainther-ant, Meudon, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

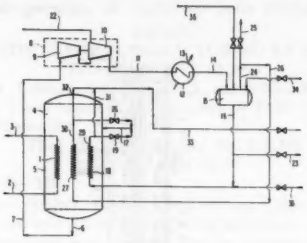
Continuation of Ser. No. 250,788, Apr. 3, 1981, abandoned. This application Oct. 29, 1982, Ser. No. 437,727

Claims priority, application France, Apr. 4, 1980, 80 07685

Int. Cl.³ F25J *1/02*

U.S. Cl. 62—40 **17 Claims**

1. A cooling process, comprising; cooling a fluid flow for recovering or fractionating an NGL mixture including substantial portions of butane and propane and present in a crude gas with a closed cooling loop which includes a mechanical cycle by passing a coolant through said loop substantially



flow-isolated from said fluid flow, said coolant consisting primarily of said NGL mixture.

4,526,597

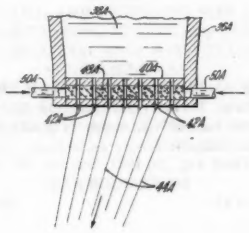
GAS INJECTION IN FIBER FORMING

John L. Olinger, Newark, and Seshadri Srinivasan, Pickerington, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 23, 1984, Ser. No. 643,564

Int. Cl.³ C03B *37/085, 37/04*

U.S. Cl. 65—1 **20 Claims**



8. Apparatus for forming mineral fibers comprising a container for holding a body of molten mineral material, said container having an orificed wall from which streams of molten material emanate to form fibers, a porous member positioned within said container in a region normally covered by molten mineral material, and means for supplying a gas to said porous member under pressure sufficient to cause introduction of the gas into the molten mineral material.

4,526,598

METHOD AND APPARATUS FOR FORMING A BUNDLE OF GLASS FILAMENTS

Walter J. Reese, North Huntington, and George T. Salego, Brackenridge, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 30, 1983, Ser. No. 567,021

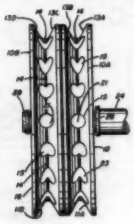
Int. Cl.³ C03B *37/03*

U.S. Cl. 65—3.1 **12 Claims**

1. In an apparatus for forming one or more bundles of glass filaments from heat softenable, fiberizable glass forming material, comprising:

a multiple glass filament forming means, an applicator for applying chemicals for filament treatment, a rotatable gathering shoe for gathering filaments into bundles and a winder mechanism for collecting the bundles of filaments, the Improvement, comprising: one or more rotatable gathering shoes wherein each has an annular groove for receiving the glass fibers wherein each groove has a plu-

rality of spaced apart radial holes extending into the center of the shoe for a distance less than the entire radial distance of the pulley wherein the holes have opposing and bottom sides, and where the gathering shoe when



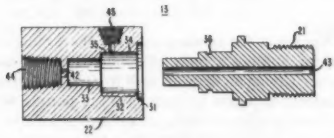
rotating reduces the wrapping of wet filaments and strands about the gathering shoe, since the holes sufficiently reduce the surface contact between the filaments and strands and the shoe.

4,526,599

OPTICAL FIBER FABRICATION PROCESS

Robert L. Barns, Berkeley Heights, and Arthur D. Pearson, Bernardsville, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 28, 1981, Ser. No. 297,213
Int. Cl.³ C03B *37/07*
U.S. Cl. 65—3.12 **10 Claims**



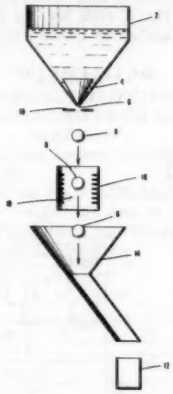
1. A method of forming an optical fiber, the method comprising flowing a first gas comprising glass precursor gas through a seal from a first stationary structure to a second structure rotating relative to the first structure, reacting in the second structure at least some of the glass precursor gas to form a glass, and forming the glass into an optical fiber, the fiber having an added loss at 1.39 microns of less than 2 db/km, the seal comprising a first member essentially rigidly connected to the first structure and a second member essentially rigidly connected to the second structure, the second member seated at least partially within the first member, with a clearance between the first member and the second member, thereby forming a clearance region through which ambient gas could enter to contaminate the first gas, the clearance region comprising a first and a second portion, the first portion being upstream of the second portion, relative to the flow of first gas, the clearance of the first portion being smaller than the clearance of the second portion, the method further comprising counterflowing noncontaminant second gas within the clearance region, whereby contamination of the first gas by the ambient gas can be substantially reduced.

4,526,600

METHOD FOR THE LUBRICATION OF DELIVERY EQUIPMENT AND MOLDS USED IN PRODUCTION OF GLASS ARTICLES

Ronald T. Myers, Brockway, Pa., assignor to Brockway, Inc., Brockway, Pa.

Filed Jan. 27, 1983, Ser. No. 461,544
Int. Cl.³ C03B *40/02*
U.S. Cl. 65—24 **23 Claims**



1. In a method for the production of glass articles wherein viscous glass in the form of glass gobs or parisons is provided, caused to be placed in a mold of suitable configuration and permitted to cool to form a glass article, the improvement comprising applying a lubricant to the surface of said viscous glass prior to entry of said viscous glass in said mold.

9. In a method for the production of glass articles wherein a plurality of viscous glass gobs are provided, caused to be placed in a mold of suitable configuration are permitted to cool to form a glass article, the improvement comprising coating at least a portion of said plurality of glass gobs prior to entry thereof in said mold by causing at least a portion of said plurality of glass gobs to pass through at least one flame having entrained therein a particulate lubricant whereupon said lubricant adheres to said gobs.

4,526,601

METHOD OF FIXING AN ELECTRON GUN ASSEMBLY INTO THE NECK OF A CATHODE RAY TUBE AND STRUCTURE SO PRODUCED

Kimizo Igarashi, Tokyo; Katsumi Takigawa, Yamato; Tsuneo Muchi, Kawasaki; Yoshio Matsumoto, Tokyo; Kiichi Ueno, Yamanishi, and Akio Ohkoshi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 22, 1982, Ser. No. 341,642
Claims priority, application Japan, Jan. 27, 1981, 56-10499
Int. Cl.³ C03B *23/20*
U.S. Cl. 65—59.1 **4 Claims**

1. A method of fixing an electron gun and stem assembly into the neck of a cathode ray tube which includes the steps of:

assembling said stem with a metal collar having a radially inwardly extending flange portion at the base thereof,

said stem having a reduced diameter upper portion which provides a groove between itself and the inner periphery of said collar,

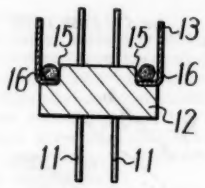
said metal collar being seated with its inwardly extending radial flange on the base of said groove;

introducing a glass frit having an initial melting point lower than that of said stem into said groove,

heating the resulting assembly in vacuum by means of high frequency heating to cause said metal collar to give off

radiant heat which removes any gas contained within said glass frit,

inserting the end of a cathode ray tube neck into the glass within said groove,



heating said assembly while so positioned to render the glass in said groove molten, and

solidifying the glass in said groove to cause said neck to be bonded therein.

4,526,602

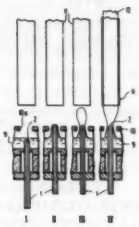
EQUIPMENT AND METHOD FOR MANUFACTURING THIN GLASS FLAKES

Pavao Pavlovi , Koparska 54, and Branko Gnjidi , Titogradska 15, both of 52000 Pula, Yugoslavia

Filed Jun. 6, 1983, Ser. No. 501,452

Int. Cl.³ C03B *9/03*

U.S. Cl. 65—81 **9 Claims**



8. A method of manufacturing thin glass flakes, comprising the steps of:

(i) positioning the blow-pipe means at a lower position where the top of said means is completely beneath the level of molten glass

(ii) sliding said blow-pipe means vertically upwards to an upper position at which the top of said means lies generally within a furnace cover plate orifice means, and said blow-pipe means lies generally within the molten glass whereby thermal expansion of air enclosed within said blow-pipe means causes formation of an initial glass bubble on the surface of collected molten glass at the top of said blow-pipe,

(iii) applying compressed air to said blow-pipe means whereby the initial glass bubble is increased in size and is pushed upwards to form a constrained part-cylindrical glass bubble,

(iv) further applying compressed air to said blow-pipe means whereby the constrained part-cylindrical bubble is increased in size forming a thin wall glass cylinder which expands freely upwards through a holding tube means without being pressed against its wall until all of the collected molten glass at the top of said blow-pipe means is used up, discontinuing the supply of air, withdrawing said blow-pipe means beneath the surface of the molten glass in the furnace, and removing the expanded thin glass cylinder from the holding tube means, and crushing the glass cylinder to obtain thin glass flakes.

4,526,603

METHOD FOR MANUFACTURING AN OPAL BOROSILICATE GLASS

Richard L. Lehman, Belle Mead, N.J., and William H. Manring, Hilton Head Island, S.C., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 28, 1983, Ser. No. 479,302

Int. Cl.³ C03C *3/08*

U.S. Cl. 65—136 **12 Claims**

1. In the process of melting and refining a glass batch containing sand and other glass-forming ingredients to form an opal borosilicate glass product wherein said batch is heated and melted at temperatures from about 1400° C. to about 1650° C. and wherein a phosphorus-containing compound and a calcium-containing compound are added to said batch, the improvement which comprises adding a compound selected from the group consisting of limestone, calcium carbonate, and calcium oxide as the calcium-containing compound and wetting the batch with phosphoric acid whereby the phosphorus-containing compound is supplied and a cohesive glass batch is formed, said batch being wetted by adding phosphoric acid thereto subsequently to the addition of the sand and calcium-containing compound.

4,526,604

MOULD ARRANGEMENT FOR A CYCLICLY-OPERATING GLASSWARE CONTAINER MANUFACTURING MACHINE WITH TEMPERATURE SENSING MEANS

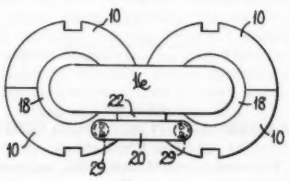
Frank A. Fenton, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Feb. 27, 1984, Ser. No. 584,027

Claims priority, application United Kingdom, Mar. 7, 1983, 8306146

Int. Cl.³ C03B *9/38*

U.S. Cl. 65—158 **10 Claims**



1. An improved mould arrangement for a cyclicly-operating glassware container manufacturing machine, of the type including two side mould portions movable relative to one another between a mould closed position in which the side mould portions co-operate to define a mould cavity with an upwardly-facing opening and a mould open position in which moulded articles can be removed from the mould; a mould closing member mounted on a support for movement between an operative position thereof, in which the member engages the side portions and closes the upwardly-facing opening of the mould cavity, and out-of-the-way position thereof; and a device for detecting the temperature of said mould;

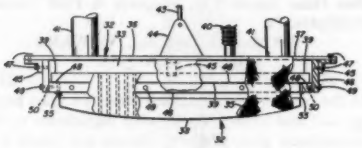
wherein the improvement comprises an improved device for detecting the temperature of said mould, comprising a thermocouple mounted on the support for movement therewith, positioned to detect the temperature on or near one of the side mould portions when the member is in its operative position.

4,526,605

VACUUM MOLD FOR SHAPING GLASS SHEETS

Robert G. Frank, Murrysville; Michael T. Fecik, Pittsburgh, and John J. Ewing, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 15, 1983, Ser. No. 532,422
Int. Cl.³ C03B *23/035*
U.S. Cl. 65—273 11 Claims



1. An apparatus for shaping glass sheets comprising:

an upper box with an upper plate member, wall members and rigid edges extending inwardly from said wall members to provide said box with a peripheral supporting ledge;

a lower refractory wall member having a lower shaping surface defining a desired glass sheet shape and an outwardly extending peripheral ledge overlapping and resting on said peripheral supporting ledge of said upper box, said lower refractory wall member being apertured therethrough connecting said lower shaping surface with a chamber defined by said lower refractory wall member and said upper box, wherein corresponding supporting ledge portions of said upper box and extending peripheral ledge portions of said lower refractory wall member are sized to terminate said outwardly extending peripheral ledges in spaced relation to adjacent portions of said wall member in said inwardly extending peripheral supporting ledges in spaced relation to adjacent portions of said lower refractory wall member to provide a non-fixed support of said lower refractory wall by said upper box and accommodate thermal expansion of said upper box without affecting said lower refractory wall member;

means to seal said upper box with said lower refractory wall member; and

means adapted to connect said chamber to a vacuum source.

4,526,606

UREA-FORMALDEHYDE LIQUID FERTILIZER SUSPENSION

Richard E. Formaini, Stone Mountain, Ga., assignor to Georgia-Pacific Resins, Inc., Atlanta, Ga.

Filed May 5, 1983, Ser. No. 491,988
Int. Cl.³ A01N *25/00*
U.S. Cl. 71—3 29 Claims

1. A process for preparing a urea-formaldehyde condensate suitable for producing a urea-formaldehyde fertilizer suspension having a slowly releasable source of nitrogen comprising the steps of:

(a) reacting urea, formaldehyde and a water soluble sugar in an aqueous reaction medium having a urea to formaldehyde mol ratio in the range of about 0.35 to about 0.5 and having from about 0.15 to about equal parts by weight sugar for each part by weight of said formaldehyde, said reaction being conducted at a slightly alkaline pH under reflux conditions for a period of about 0.2 to about 2.0 hours; and

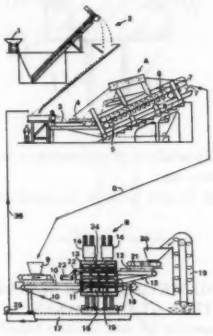
(b) adjusting the reaction mixture of step (a) to an acidic pH and further reacting the mixture until a product with a viscosity within the range of about a Gardner A-J is obtained.

4,526,607

DEWATERING OF NATURALLY MOIST CRUDE PEAT

Burkard Rosenberg, Horw, Switzerland, assignor to Bell Maschinenfabrik Aktiengesellschaft, Kriens, Switzerland

Filed Oct. 20, 1983, Ser. No. 543,986
Claims priority, application Switzerland, Nov. 3, 1982, 6386/82
Int. Cl.³ C05F *11/02*
U.S. Cl. 71—24 9 Claims



1. A method of dewatering naturally moist crude peat comprising passing the crude moist peat through a first dewatering press to produce an intermediate product with a reduced water content; and further dewatering the peat in stages in a filter press system having at least two successive filter press chambers, the respective filter cake being loosened in passage between the filter press chambers, and compacted in the final dewatering stage.

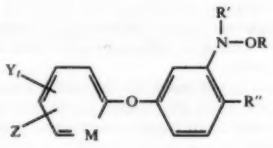
4,526,608

CERTAIN 2-PYRIDYLOXYPHENYL-OXIMINO-ETHER-CARBOXYLATES, HERBICIDAL COMPOSITIONS CONTAINING SAME AND THEIR HERBICIDAL METHOD OF USE

Shy-Fuh Lee, Sunnyvale, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 398,046, Jul. 14, 1982, abandoned, which is a continuation-in-part of Ser. No. 344,168, Jan. 29, 1982, abandoned. This application Mar. 31, 1983, Ser. No. 481,044
Int. Cl.³ C07D *213/64*; A01N *43/40*
U.S. Cl. 71—94 8 Claims

1. A compound of the following formula (A):



wherein

M is N;

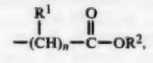
t is zero, one or two;

each of Y and Z is independently selected from hydrogen, lower alkyl, lower haloalkyl, or halogen;

R′ is lower alkyl;

R″ is nitro, amino, cyano or chloro;

R is the group



wherein,

n is zero, one or two;

R^1 is hydrogen, methyl, methoxy or methylthio;

R^2 is hydrogen, sodium cation, lower alkyl, lower alkenyl, lower alkynyl, lower alkylthioalkyl, lower alkoxyalkyl, lower alkylsulfinylalkyl, lower alkylsulfonylalkyl, unsubstituted phenyl, cycloalkyl having 3 to 8 carbon atoms, lower haloalkyl, lower alkoxyalkoxyalkyl, lower alkylamino, lower dialkylamino, or $N{=}C(R^8)_2$; and

R^8 is lower alkyl.

8. A method for the control of weeds which comprises applying to the locus of the weeds a herbicidally effective amount of a compound according to claim **1**.

4,526,609

PHENOXY PHONOXY PROPIONIC HYDRAZIDES

Georg Fráter, Greifensee; Milos Suchy, Pfaffhausen; Jean Wenger, Uster, and Paul Winternitz, Greifensee, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

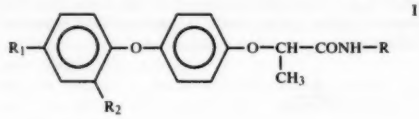
Filed May 21, 1982, Ser. No. 380,654

Claims priority, application Switzerland, May 26, 1981, 3441/81; Mar. 31, 1982, 1983/82

Int. Cl.[3] **A01N** *37/18;* **C07C** *103/22, 103/30*

U.S. Cl. 71—118 **9 Claims**

1. A compound of the formula



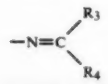
I

wherein

R_1 is chlorine, iodine or trifluoromethyl,

R_2 is hydrogen or chlorine and

R is the group:



(a)

wherein

R_3 and R_4 are hydrogen, C_{1-4}-alkyl, C_{1-4}-haloalkyl, phenyl, phenyl substituted with chlorine, methyl, methoxy and/or nitro, benzyl, benzyl substituted in the aryl nucleus with chlorine, methyl, methoxy and/or nitro, or together with the carbon atom to which they are attached from a C_{5-7}-cycloalkane ring.

9. A method for combatting weeds which comprises applying to the locus to be protected, a herbicidally effective amount of the composition of claim **8**.

4,526,610

METAL CORED CERAMIC SURFACED FINE POWDER MATERIAL AND APPARATUS AND METHOD FOR MAKING IT

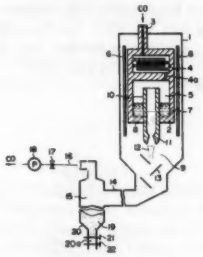
Hirohisa Miura; Hiroshi Satou; Toshio Natsume, and Hidenori Katagiri, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 1, 1983, Ser. No. 481,464

Claims priority, application Japan, Apr. 2, 1982, 57-54873

Int. Cl.[3] **B22D** *23/08*

U.S. Cl. 75—0.5 BC **19 Claims**



1. A method of making a ceramic-metallic composite fine powder material composed of fine powder particles each having a metallic core and a ceramic surface layer which is a compound of the metal composing said core and another element, the average value of the ratio of the thickness of the surface layer of a powder particle to the radius of the particle being substantially greater than 0.05, comprising:

(a) mixing said metal in a gaseous form with said another element in the gaseous state, and

(b) passing the resulting mixture through a convergent-divergent nozzle, thereby rapidly cooling the mixture by adiabatic expansion.

4,526,611

PROCESS FOR PRODUCING SUPERFINES OF METAL

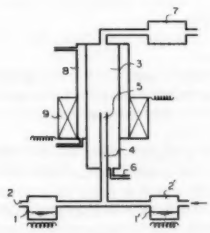
Akinori Yoshizawa, 5-24-16, Nakano, Nakano-ku, Tokyo; Yasuo Nakane, Tokyo; Kenji Hagimori, Takasaki; Koya Ohgai, Funabashi; Norisada Arisawa; Tadashi Takahashi, both of Fujioka; Hideaki Maekawara, Annaka; Hiroyuki Imaizumi, Fujioka; Hideyuki Tsuchida, Tokyo; Eiichirou Mieno, and Kenji Sugino, both of Annaka, all of Japan, assignors to Toho Zinc Co., Ltd. and Akinori Yoshizawa, both of Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,006

Claims priority, application Japan, Mar. 14, 1983, 58-41970

Int. Cl.[3] **B22F** *9/00*

U.S. Cl. 75—0.5 B **14 Claims**



1. A process for producing superfine metal particles in a reaction zone comprising

contacting a stream of a metal halide containing gas with a stream of a reducing gas, the stream of said metal halide

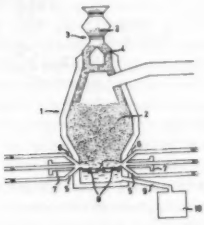
containing gas and the stream of said reducing gas flow concurrently and at different velocities when they contact each other to form an interfacial instability region in the reaction zone wherein nuclei of said metal are formed, said reaction being cooled to inhibit excessive growth of said metal nuclei thereby producing said superfine metal particles.

4,526,612

METHOD OF MANUFACTURING FERROSILICON

Sune Eriksson, and Sven Santén, both of Hofors, Sweden, assignors to SKF Steel Engineering AB, Sweden

Filed Aug. 25, 1983, Ser. No. 526,412
Claims priority, application Sweden, Sep. 8, 1982, 8205086
Int. Cl.³ C22B 4/00
U.S. Cl. 75—10 R **17 Claims**



1. A continuous method of manufacturing ferrosilicon which comprises continuously injecting a starting material substantially in fine grained form and containing a silica-containing material and an iron-containing material, with a carrier gas, into a plasma gas generated by a plasma generator; thereby heating the material and continuously introducing the silica- and iron-containing material so heated, with the plasma gas into a reaction chamber surrounded substantially on all sides by a solid reducing agent in lump form, thereby bringing the silica to molten state and reducing it to silicon and causing said silicon to combine with the iron to form ferrosilicon.

4,526,613

PRODUCTION OF ALLOY STEELS USING CHEMICALLY PREPARED V_2O_3 AS A VANADIUM ADDITIVE

Gloria M. Faulring, Niagara Falls, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 12, 1984, Ser. No. 588,411
Int. Cl.³ C22B 4/00
U.S. Cl. 75—12 **8 Claims**

1. A process for producing alloy steel which comprises:

(a) forming a molten alloy steel in an electric furnace;

(b) pouring the molten steel from the electric furnace into a transfer ladle;

(c) loading the molten steel from the transfer ladle into an AOD vessel;

(d) adding to the molten steel in the electric furnaace, transfer ladle or AOD vessel a vanadium additive consisting essentially of finely divided chemically prepared substantially pure V_2O_3;

(e) generating a slag covering the molten steel in the AOD vessel, the slag containing CaO and SiO_2 in a weight ratio of CaO/SiO_2 which is equal to or greater than unity.

(f) adding to the molten steel in the AOD vessel an oxidizable metal selected from the group consisting of aluminum and silicon or mixtures thereof; and

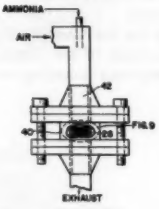
(g) injecting a gaseous mixture of argon or nitrogen or both and oxygen into the AOD vessel, the proportion of argon or nitrogen to oxygen in the gaseous mixture being such as to continuously provide a reducing atmosphere in contact with the molten steel.

4,526,614

METHOD FOR RECOVERING PLATINUM IN A NITRIC ACID PLANT

Bahjat S. Beshty, Princeton; W. Robert Hatfield, Westfield; Hyo C. Lee, Edison; Ronald M. Heck, Frenchtown, and Thomas H. Hsiung, Piscataway, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 331,333, Dec. 16, 1981, abandoned, and a continuation-in-part of Ser. No. 292,114, Aug. 12, 1983, abandoned, and Ser. No. 292,113, Aug. 12, 1983, abandoned. This application Aug. 2, 1982, Ser. No. 403,997
Int. Cl.³ C22B 11/12
U.S. Cl. 75—83 **32 Claims**



1. An improved method for recovering platinum lost from a platinum containing catalyst gauze in a nitric acid plant, said plant being of the type wherein ammonia and air are passed over said catalyst gauze to oxidize said ammonia to nitrogen oxides with platinum being lost from the catalyst gauze to the process stream, said plant being of the type which is normally operated continuously for a period of time "Tp", after which period has elapsed tne operation of the plant is interrupted and the catalyst gauze is replaced, said plant being of the type wherein recovery gauze comprising at least a major proportion of palladium is placed downstream of the catalyst gauze closely adjacent to the catalyst gauze whereby the platinum containing process stream leaving the catalyst gauze passes over the recovery gauze and a portion of the platinum which was lost to the process stream is recovered by said recovery gauze, wherein the improvement comprises using a platinum recovery gauze of predetermined geometric configuration adapted to the process conditions of the plant such that the recovery gauze cycle length "T" as calculated from the formula

$$T = \frac{W}{1.25\,\eta\,bL}$$

is in the range of from about 0.9 Tp to about 1.1 Tp, (Tp being as defined above) and W is the weight of the recovery gauze sheet, η is the recovery efficiency of the recovery gauze sheet as calculated according to the formula

$$\eta = 1 - \exp\left[-\frac{2C}{Sc^{\frac{1}{3}}} \cdot \frac{ad_w}{Re^m\,\xi^{1-m}}\right]$$

wherein "ξ" is the volumetric void fraction of the gauze which is less than about 0.76 but greater than 0; "Sc" is the Schmidt number for the diffusion of oxidized platinum in the effluent from the catalyst gauze; "Re" is the Reynolds number based on the wire diameter and average velocity of the process stream just upstream of the recovery gauze, i.e., $Re = G\,d_w/\mu$, where "G" is the mass velocity of the gaseous stream fed to the catalyst; "μ" is the viscosity of the gas passing through the recovery gauze; "C" is the appropriate mass transfer correlation coefficient for the geometry of the gauze; "a" is the specific bulk surface area of the gauze; "m" is the appropriate mass transfer correlation exponent for the configuration of the

gauze; "d_w" is the diameter of the wires in the gauze, and "b" is the amount of platinum lost from the catalyst gauze for each ton of nitrogen (in ammonia) converted; and "L" is the loading or amount of nitrogen (in ammonia) passed over each square meter of the catalyst gauze per day, whereby said catalyst gauze and said recovery gauze may economically be changed simultaneously when the catalyst is normally changed as said recovery gauze will then be approaching the end of its useful life.

4,526,615

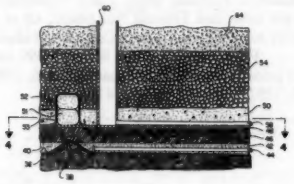
CELLULAR HEAP LEACH PROCESS AND APPARATUS

Paul H. Johnson, P.O. Box 31, McIntosh, N. Mex. 87032

Continuation of Ser. No. 471,033, Mar. 1, 1983,. This application Jan. 29, 1985, Ser. No. 696,842

Int. Cl.³ C22B *1/00*

U.S. Cl. 75—101 R **12 Claims**



1. A heap leach system for leaching metal values from ores comprising:

an impermeable pad having a plurality of reservoirs formed on said pad, said reservoirs being capable of

ore placed upon said pad for leaching, said ore comprising a plurality of separately identifiable cellular heaps by reference to the respective reservoirs on the pad, said cellular heaps further being arranged in layers, with substantially unleached cellular heaps placed so as to overlie substantially leached cellular heaps, said overlying heaps being separated from underlying cellular heaps by an impermeable material so that leaching of overlying cellular heaps can be performed independently of leaching of respective underlying cellular heaps;

means for introducing leach solution onto the surface of each substantially unleached cellular heap independently of other cellular heaps;

means for collecting leach solution from each cellular heap into its respective underlying reservoir independently of other cellular heaps; and

means for removing leach solution from each of said reservoirs independently of the other reservoirs.

4,526,616

LOAD-BEARING THERMAL INSULATOR

Thomas G. Fennell, Coventry, and Ronald Fisher, Rugby, both of England, assignors to Dunlop Limited, London, England

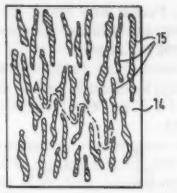
Filed Jul. 12, 1983, Ser. No. 513,090

Claims priority, application United Kingdom, Jul. 27, 1982, 82 21692

Int. Cl.³ C07C *29/00*

U.S. Cl. 75—234 **8 Claims**

1. A load-bearing material insulator comprising platelets or flakes of mica dispersed in a metal matrix, wherein a majority of the platelets or flakes are so oriented that their major axes lie approximately normal to the direction of heat flow so as impede the flow of heat through the matrix material; the mica platelets or flakes being 10 to 30 percent by weight.



4,526,617

WEAR RESISTANT FERRO-BASED SINTERED ALLOY

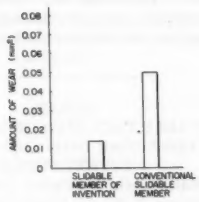
Takeshi Hiraoka; Shigeru Urano; Masajiro Takeshita, all of Saitama, and Keiji Nakamura, Chiba, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed May 9, 1980, Ser. No. 148,357

Claims priority, application Japan, May 9, 1979, 54-55683

Int. Cl.³ B22F *3/00*

U.S. Cl. 75—236 **1 Claim**



1. A wear resistant ferro-based sintered alloy, consisting essentially of:

a base structure consisting essentially of a mixture of 20 to 50% by area ratio of pearlite, 15 to 50% by area ratio of bainite and 15 to 40% by area ratio of martensite, and 3 to 20% by area ratio of ferromolybdenum particles dispersed uniformly in the base structure, wherein the the alloy consists essentially of 0.8 to 1.5% by weight carbon, 0.5 to 4% by weight nickel, 0.5 to 2% by weight copper, 2.5 to 6.5% by weight molybdenum and the balance iron.

4,526,618

ABRASION RESISTANT COATING COMPOSITION

Madapusi K. Keshavan, and Merle H. Weatherly, both of Indianapolis, Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 18, 1983, Ser. No. 543,142

Int. Cl.³ B22F *1/00, 3/00, 7/00*

U.S. Cl. 106—1.05 **4 Claims**

1. A coating composition applied to a substrate by a thermal spray process which comprises tungsten carbide and a boron containing alloy or a mixture of alloys with a total composition of from about 6.0 to 18.0 weight percent boron, 0 to 6 weight percent silicon, 0 to 20 weight percent chromium, 0 to 5 weight percent iron and the balance nickel; the tungsten carbide comprising about 78 to 88 weight percent of the entire composition.

4,526,619
GYPSUM COMPOSITION FOR DENTURE INVESTMENT

Nobukazu Ohi, Fuchu; Koji Ohno, Akabanenishi, and Satoshi Tosaki, Tokyo, all of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,331
Claims priority, application Japan, Aug. 13, 1982, 57-139799
Int. Cl.³ C09K *3/00*
U.S. Cl. 106—35 **3 Claims**

1. A gypsum composition for denture investment consisting of 100 parts by weight of a mixture of 50–90 parts by weight of α-Gypsum hemihydrate (α-$CaSO_4 \cdot \frac{1}{2}H_2O$), 10–50 parts by weight of β-Gypsum hemihydrate (β-$CaSO_4 \cdot \frac{1}{2}H_2O$), 0.2–2.0 parts by weight of a soluble potassium salt, and 0.5–5.0 parts by weight of gypsum dihydrate.

4,526,620
CELLULOSE CARBAMATE SOLUTIONS

Johan Selin, Helsinki; Jouko Huttunen, Porvoo; Olli Turunen, Porvoo; Vidar Eklund, Porvoo, and Kurt Ekman, Porvoo, all of Finland, assignors to Neste Oy, Finland

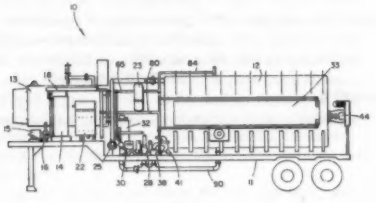
Filed Nov. 30, 1983, Ser. No. 556,332
Claims priority, application Finland, Dec. 8, 1982, 824215
Int. Cl.³ C08L *1/00;* **C08B** *15/06*
U.S. Cl. 106—203 **15 Claims**

1. Solution from which cellulose carbamate fiber or film can be formed, said solution comprising a predetermined amount of cellulose carbamate dissolved in a predetermined amount of aqueous alkali solution containing urea, said solution having a viscosity which is lower than the viscosity of a solution of the same predetermined amount of cellulose carbamate in the same predetermined amount of aqueous alkali solution without said urea.

4,526,621
PORTABLE FACILITY FOR PROCESSING GRANULATED SUGAR INTO LIQUID SUCROSE AND INVERT SUGAR

Melvin C. Fields, Muncie, and Paul F. Fields, Parker City, both of Ind., assignors to Process Supply Company, Inc., Muncie, Ind.

Filed Sep. 6, 1983, Ser. No. 529,356
Int. Cl.³ C13K *1/00*
U.S. Cl. 127—1 **4 Claims**

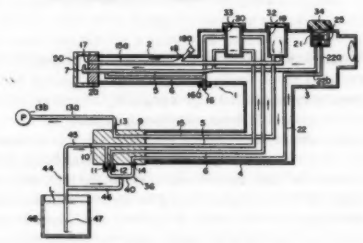


1. A mobile sugar processing facility, comprising:
- a flatbed trailer;
- a process tank mounted in said flatbed trailer, said process tank including heat panels positioned on opposite sides of said process tank;
- a boiler mounted on said flatbed trailer in tandem ahead of said process tank;
- a boiler feed tank mounted on one side of said boiler in fluid communication therewith;
- a heat exchanger mounted above said boiler feed tank and operably connected to said boiler and an external water supply so as to provide heat exchange therebetween;
- a water filter mounted at substantially the same height as said heat exchanger and between said boiler and said process tank, said water filter operably connected to said process tank and said heat exchanger in order to filter water entering said process tank from said heat exchanger;
- a first pump mounted between said boiler and said process tank and operably connected to said process tank and an external source of a slurry of granulated sugar in order to pump said slurry into said process tank;
- a second pump mounted between said boiler and said process tank;
- a conduit means connected between said process tank and said second pump, said conduit means extending substantially along the underside of said flatbed trailer, said second pump operable to pump finished product from said process tank;
- a third pump means mounted between said boiler and said process tank and operably connected to said heat exchanger and said heat panels on said process tank in order to provide circulation of hot water from said heat exchanger to said heat panels.

4,526,622
METHOD OF CLEANING ENDOSCOPE CHANNELS

Koji Takamura; Fumiaki Ishii; Yukio Nakajima; Hisao Yabe; Hiroyuki Sasa, and Takeaki Nakamura, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,161
Claims priority, application Japan, Apr. 15, 1983, 66798; Apr. 25, 1983, 72521; Apr. 27, 1983, 74773
Int. Cl.³ B08B *3/04, 9/00*
U.S. Cl. 134—21 **6 Claims**



1. A method of cleaning channels of an endoscope which includes a control section, an insertion section extending from the control section and having a nozzle at its distal end, a light guide cable extending from the control section and having a connector at its distal end, an air supply channel extending in the endoscope and having one end communicating with the nozzle and the other end opening to the connector, a liquid supply channel extending in the endoscope and having one end communicating with the nozzle and the other end opening to the connector, a suction channel extending in the endoscope and having one end opening to the distal end of the insertion section and the other end opening to the connector, an air/liquid supply valve cylinder arranged in the control section to communicate with the air supply channel and liquid supply channel and having one end opening to the outside of the control section, and a suction valve cylinder arranged in the control section to communicate with the suction channel and having one end opening to the outside of the control section; said method comprising:
- a first step of placing a confining member in a prescribed position so that liquid is confined to flow between said one end of said suction channel and said nozzle;
- a second step of closing the open end of said air/liquid supply valve cylinder and the open end of said suction valve cylinder;
- a third step of bringing the other ends of two of said suction channel, air supply channel and liquid supply channel into contact with liquid; and

a fourth step of sucking the liquid from the other end of the remaining one of said three channels through said three channels, said air/liquid supply valve cylinder and said suction valve cylinder, thereby cleaning the interior of the channels and cylinders.

4,526,623

METHOD OF CLEANING ENDOSCOPE CHANNELS

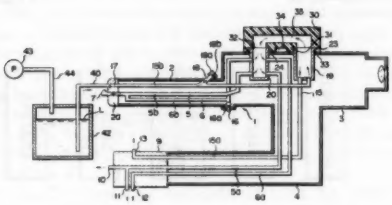
Fumiaki Ishii; Hiroyuki Sasa; Hisao Yabe; Yukio Nakajima; Koji Takamura, and Takeaki Nakamura, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,707

Claims priority, application Japan, Apr. 15, 1983, 58-66799; Apr. 15, 1983, 58-66800; May 16, 1983, 58-85551

Int. Cl.³ B08B *3/04, 9/00*

U.S. Cl. 134—21 **8 Claims**



1. A method of cleaning an endoscope which includes a control section, an insertion section extending from the control section and having a nozzle at its distal end, a light guide cable extending from the control section and having a connector at its distal end, an air supply channel extending in the endoscope and having one end communciating with the nozzle and the other end opening to the connector, a liquid supply channel extending in the endoscope and having one end communicating with the nozzle and the other end opening to the connector, a suction channel extending in the endoscope and having one end opening to the distal end of the insertion section and the other end opening to the connector, an air/liquid supply valve cylinder arranged in the control section to communicate with the air supply channel and liquid supply channel and having one end opening to the outside of the control section, and a suction valve cylinder arranged in the control section to communicate with the suction channel and having one end opening to the outside of the control section; said method comprising:

a first step of mounting communicating means on the open ends of the air/liquid supply valve cylinder and suction valve cylinder, so that liquid is confined to flow between the valve cylinders, and

a second step of supplying liquid from at least one of the following five ports and discharging the liquid from the remaining ports through the three channels, the air/liquid supply valve cylinder and the suction valve cylinder, thereby cleaning the interior of the channels and valve cylinders with the liquid:

(a) the nozzle;

(b) said one end of the suction channel;

(c) the other end of the air supply channel;

(d) the other end of the liquid supply channel;

(e) the other end of the suction channel.

4,526,624

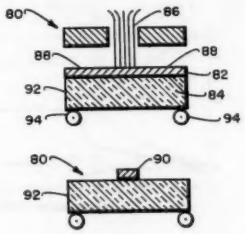
ENHANCED ADHESION OF FILMS TO SEMICONDUCTORS OR METALS BY HIGH ENERGY BOMBARDMENT

Thomas A. Tombrello, Altadena, Calif.; Yuanxun Qiu, Shanghai, China, and Marcus H. Mendenhall, Lawrenceburg, Ind., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jul. 2, 1982, Ser. No. 394,816

Int. Cl.³ H01L *21/265;* **C23C** *13/02*

U.S. Cl. 148—1.5 **15 Claims**



1. A method of improving the adhesion of a first surface of a metal or a first semiconductor to a surface of a second semiconductor, each of said semiconductors having a resistivity below 10^3 ohm-cm, a band gap from 0.01 eV to 5 eV and being an element selected from Groups III, IV or VI of the Periodic Table or a compound selected from III-V compounds or II-VI compounds comprising the steps of:

bringing the two surfaces into contact; and

applying high energy ions having an energy of at least 0.1 MeV/amu to the interface of the two surfaces for a period sufficient to improve adhesion.

4,526,625

PROCESS FOR THE MANUFACTURE OF CONTINUOUS STRIP CAST ALUMINUM ALLOY SUITABLE FOR CAN MAKING

Harish D. Merchant, Fairfield, Conn.; James G. Morris, Lexington, Ky., and Gunther Scharf, Bonn, Fed. Rep. of Germany, assignors to Continental Can Company, Stamford, Conn.

Continuation-in-part of Ser. No. 398,735, Jul. 15, 1982, abandoned. This application Apr. 8, 1983, Ser. No. 483,453

Int. Cl.³ C22F *1/04*

U.S. Cl. 148—2 **11 Claims**

1. A process for fabricating aluminum alloy strip stock suitable for the manufacture of drawn and wall-ironed articles comprising

continuously casting an aluminum alloy in strip form having a thickness up to one inch,

homogenizing the strip at a temperature of about 950° to about 1150° F. for up to 50 hours,

cold rolling the homogenized strip by at least 25% reduction in thickness,

heating the cold rolled strip to a recovery temperature of between about 350° and about 550° F.,

cold rolling the strip to a second reduction in thickness of at least 10%,

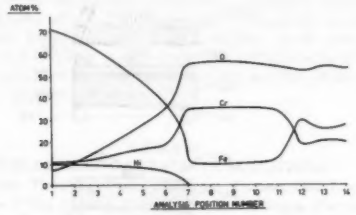
heating the cold rolled strip to a recrystallization temperature of between about 600° and about 900° F. and then,

cold rolling the recrystallized strip to a final gauge having a total reduction in thickness of at least about 50%.

4,526,626
ANTI-CORROSION TREATMENT PROCESS

John H. Carter, Bromley, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Sep. 7, 1983, Ser. No. 529,988
Claims priority, application United Kingdom, Sep. 8, 1982, 8225610
Int. Cl.³ C23F 7/04
U.S. Cl. 148—6.14 R 14 Claims

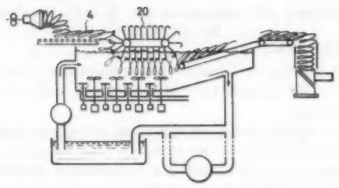


1. An anti-corrosion treatment process for protecting an alloy, containing chromium and at least one metal selected from nickel and cobalt, against corrosion by superheated water comprising exposing the alloy to an aqueous solution containing iron, preferably ferrous, ions and a complexone selected from at least one of EDTA, a salt of EDTA, a derivative of EDTA and a salt of the derivative, and heating the solution to such a temperature range that a corrosion resistant film, that contains chromium oxide and iron oxide but that is substantially free from cobalt, nickel and compounds of cobalt and nickel, in formed on the surface of the alloy, and maintaining the the solution within that temperature range until the corrosion resistant film is at least 300 nm thick.

4,526,627
METHOD AND APPARATUS FOR DIRECT HEAT TREATMENT OF MEDIUM- TO HIGH-CARBON STEEL RODS

Hitoshi Iwata; Yoshihiro Hashimoto, and Katsuhiko Yamada, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Limited, Japan

Filed May 24, 1984, Ser. No. 613,485
Claims priority, application Japan, May 24, 1983, 58-91923; Oct. 28, 1983, 58-203160
Int. Cl.³ C21D 8/08, 1/64
U.S. Cl. 148—12 B 29 Claims



1. In a method of direct heat treatment of a medium- to high-carbon steel rod by performing controlled cooling on an expanded spiral coil of a hot rolled steel rod that has an austenitic structure and which is being transported continously in a generally horizontal direction, the improvement wherein the spiral coil is passed through vessel containing a coolant of a gas bubble-water mixed fluid under a strong turbulent action which contains a uniform dispersion of oxidizing gas bubbles and which is at a temperature not higher than 95° C., whereby uniform cooling conditions for the coil are provided along its entire length.

18. A direct heat treatment apparatus for a medium- to high-carbon steel rod, comprising:

a laying head for forming a spiral coil from a rolled high-temperature rod;

a heat treatment vessel for storing the rod to be cooled, said vessel being filled with an oxidative gas bubble-water mixed fluid;

at least one means for immersing, transporting and extending the spiral rod in and out the vessel;

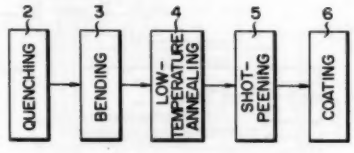
agitating means for agitating the mixed fluid in the vessel; and

means for fluidizing and circulating the gas-water mixed fluid in a direction parallel to the direction of transportation of the rod.

4,526,628
METHOD OF MANUFACTURING A CAR STABILIZER

Akira Ohno, and Kanji Inoue, both of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 485,183, Apr. 15, 1983, abandoned. This application Sep. 20, 1984, Ser. No. 653,473
Claims priority, application Japan, Apr. 28, 1982, 57-72094
Int. Cl.³ C21D 9/02
U.S. Cl. 148—12 B 9 Claims



1. A method for manufacturing a car stabilizer from a straight elongated starting material formed of carbon steel with a carbon content of 0.10% to 0.35%, comprising the steps of

quickly heating said straight starting material to a temperature of 900° C. or more within 50 seconds;

then quenching the hot material which was heated by said quick heating;

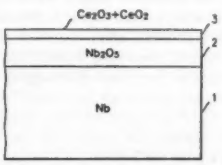
then bending the quenched material into a predetermined shape without tempering of the quenched material; and

then annealing the untempered, bent, quenched material at low temperature.

4,526,629
CATALYTIC OXIDATION OF SOLID MATERIALS

Ernst-Eberhard Latta, Adliswil, Switzerland, and Maria Ronay, Briarcliff Manor, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 15, 1984, Ser. No. 610,355
Int. Cl.³ H01L 21/363
U.S. Cl. 148—1.5 6 Claims



1. A method for controllably preparing high quality insulating oxide layers on a solid surface of material not normally oxidizable to useful quality or thickness at ambient tempera-

tures within acceptable process time durations characterized by

(a) depositing a very thin layer, 1–10 monolayers, of a rare earth having catalytic activity related to valence increase during oxidation; and

(b) exposing to oxygen in a humidity-free atmosphere for a duration and at an oxygen partial pressure required to grow the desired oxide thickness at ambient or slightly elevated temperature; whereby oxide layers are grown below threshold values for oxidation of equivalent parameters absent catalytic activity.

4,526,630

HEAT TREATMENT OF ALUMINIUM ALLOYS

David J. Field, Tean, England, assignor to Alcan International Limited, Montreal, Canada

Filed Mar. 22, 1983, Ser. No. 477,746

Claims priority, application United Kingdom, Mar. 31, 1982, 8209492

Int. Cl.³ C22F *1/04*

U.S. Cl. 148—159 **9 Claims**

1. A process for the homogenisation of ingots of ternary and quaternary alloys in the system in the system Al-Li-Cu-Mg which comprises heating the alloy ingot to a temperature of at least 530° C., but below the melting point of solid intermetallic phases contained therein and maintaining the alloy ingot at a temperature above 530° C. until such phases have entered solid solution in the alloy and then cooling the ingot, said ingot being formed of an alloy selected from the group consisting of

(1) an alloy consisting essentially of 1–3% Li, 0.5–2% Cu, 0.2–2% Mg, (Zr+Mn+Cr) up to 0.6%, (Fe+Si) up to 0.4%, other elements up to 0.05% each, up to 0.15% total, balance Al;

(2) an alloy consisting essentially of 1–3% Li, 2.4% Mg, below 0.1% Cu and having a total Li+Mg content of no more than 6.0%, (Zr+Mn+Cr) up to 0.6%, (Fe+Si) up to 0.4%, other elements up to 0.05% each, up to 0.15% total, balance Al;

(3) an alloy consisting essentially of 1–3% Li, 0.5–4% Cu, up to 0.2% Mg, (Zr+Mn+Cr) up to 0.6%, (Fe+Si) up to 0.4%, other elements up to 0.05% each, up to 0.15% total, balance Al.

4,526,631

METHOD FOR FORMING A VOID FREE ISOLATION PATTERN UTILIZING ETCH AND REFILL TECHNIQUES

Victor Silvestri, Hopewell Junction, and D. Duan-Lee Tang, Pleasantville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,320

Int. Cl.³ H01L *21/302, 21/76*

U.S. Cl. 148—175 **10 Claims**

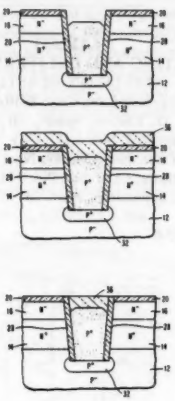
1. Method for forming a void free, deep isolation structure in a monocrystalline silicon body comprising:

providing a substantially vertically sided pattern of trenches greater than about 3 micrometers deep having an insulating layer sidewall and monocrystalline silicon bottom;

epitaxially growing monocrystalline semiconductor in said pattern of trenches from said monocrystalline semiconductor bottom while preventing any spurious growth on the surfaces of the silicon body during the epitaxial deposition by using a $SiCl_4$-H_2-HCl gaseous reaction system at about one atmosphere pressure;

continuing the epitaxial growth until the trenches are filled up to between about 300 to 1500 nanometers from the surface of the said body;

forming a chemical vapor deposited insulator layer on the surface of the semiconductor body and filling the remaining portion of the pattern of trenches; and



removing the portion of the said chemical vapor deposited insulator layer above the pattern of trenches by means of a chemical-mechanical polishing technique.

4,526,632

METHOD OF FABRICATING A SEMICONDUCTOR PN JUNCTION

Jun-ichi Nishizawa, Sendai; Kazuomi Ito, Ashikaga, and Yasuo Okuno, Sendai, all of Japan, assignors to Jun-Ichi Nishizawa, Sendai, Japan

Continuation-in-part of Ser. No. 270,817, Jun. 5, 1981, abandoned. This application Feb. 9, 1983, Ser. No. 465,176

Claims priority, application Japan, Jun. 16, 1980, 55-81213

Int. Cl.³ H01L *21/208, 21/223*

U.S. Cl. 148—171 **8 Claims**

1. A method of forming a pn junction with a Group IIB-VIB compound semiconductor crystal containing Zn as a crystal-constituent Group IIB element, substantially to the exclusion of Te as a constituent element of said compound semiconductor crystal, said method comprising the steps of:

(a) using as a solvent a mixture of Te and a crystal-constituent Group VIB element other than Te;

(b) charging a Group IB element as a p type impurity into said solvent;

(c) floating a source crystal of sid group IIB-VIB compound semiconductor on the surface of said solvent;

(d) establishing a temperature difference between said source crystal and a surface of a crystal deposition zone;

(e) depositing a p type crystal at said crystal deposition zone at a constant temperature;

(f) making a wafer by slicing the crystal thus obtained; and

(g) heat treating the resulting wafer in a Zn atmosphere.

thereby forming an n type layer locally in said p type crystal to provide a pn junction in said wafer.

4,526,633

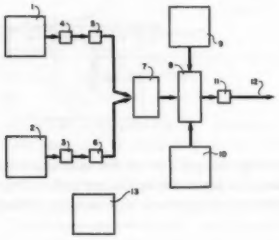
FORMULATING AND DELIVERY SYSTEM FOR EMULSION BLASTING

Larry D. Lawrence, Salt Lake City; Walter B. Sudweeks, Orem, and Raymond D. Larsen, Sandy, all of Utah, assignors to IRECO Incorporated, Salt Lake City, Utah

Continuation of Ser. No. 434,549, Nov. 8, 1982, abandoned, which is a continuation of Ser. No. 111,831, Jan. 14, 1980, abandoned. This application Mar. 23, 1984, Ser. No. 592,528

Int. Cl.[3] **D03D** *23/00*

U.S. Cl. 149—109.6 **5 Claims**



1. A method for the manufacture and bulk delivery of water-in-oil emulsion blasting agents comprising:

(a) forming an oxidizer salt solution at a temperature above the salt crystallization temperature,

(b) combining the salt solution with a liquid organic fuel and an emulsifier to form a fluid mixture thereof,

(c) blending the fluid mixture to form a water-in-oil emulsion blasting agent in a blender comprising:

(1) a housing having an inlet and an outlet,

(2) a shaft rotably mounted within the housing,

(3) a plurality of blades affixed to and extending in a lateral direction from the shaft and spaced apart along the axis of the shaft,

(4) a plurality of stators rigidly mounted within the housing and interposed between some or all of the spaces between the blades, and

(5) means for rotating the shaft and blades, and the step of rotating the shaft and blades to shear the fluid mixture and thereby form an emulsion phase.

(d) delivering the resultant emulsion blasting agent directly into a borehole or other receptacle.

4,526,634

PROCESS AND APPARATUS FOR SEPARATING LAMINATED SHEETS

Michael W. Beer, Rotherham, England, assignor to Eurobond (1984) Limited, Chesterfield, England

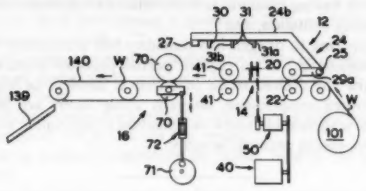
Filed Apr. 5, 1984, Ser. No. 596,931

Claims priority, application United Kingdom, Apr. 8, 1983, 8309544

Int. Cl.[3] **B32B** *31/18*

U.S. Cl. 156—64 **9 Claims**

1. Process for separating individual laminated sheets from a continuous web which comprises individual sheets located end to end with end portions overlapping and a continuous film laminated with each sheet and connecting the sheets together, the process including feeding the web in succession to a sensing station, a tear initiation station and a sheet separation station, the sensing station serving to sense the presence of successive overlapping end portions and thereafter actuating the tear initiation station to rupture the film at one edge thereof in the vicinity of a sensed overlapping portion and thereafter actuate



the sheet separation station to propagate said rupture and thereby separate the terminal sheet from the web.

4,526,635

PROCESS FOR MANUFACTURING HEAT EXCHANGERS FROM CERAMIC SHEETS

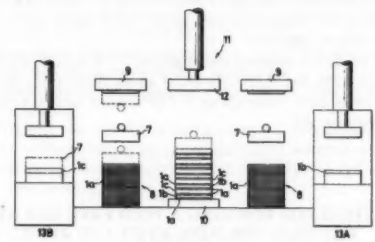
Juergen Heinrich, Schoenwald; Heinrich Schelter, Selb; Stefan Schindler, Selb, and Axel Krauth, Selb, all of Fed. Rep. of Germany, assignors to Hoechst CeramTec Ag, Selb, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,800

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136253

Int. Cl.[3] **C03B** *29/00;* **C04B** *33/34, 37/00*

U.S. Cl. 156—89 **15 Claims**



1. A process for manufacturing heat exchangers from ceramic sheets comprising the steps of:

producing ceramic sheets from a ceramic slip;

subjecting at least some of the sheets to a first forming operation to form desired flow channels therein;

applying a laminating aid to the sheets;

stacking the individual sheets in a desired order to form a heat exchanger block;

laminating the stacked sheets together;

heating the laminated heat exchanger block to reduce the organic content of the block to 40 to 60 percent of the initial organic content;

subjecting the once heat treated heat exchanger block to a second forming operation to form the assembled block to a desired configuration;

thereafter subjecting the heat exchanger block to a heat treatment at a temperature from 200° to 300° C. to remove the remaining organic content; and

sintering the laminated heat exchanger block at a temperature from 1,200° to 1,700° C.

4,526,636
METHOD OF REPAIRING BREAKS IN SHEET MATERIAL

Gerald J. Mader, 4560 S. Hydraulic, Lot 308, Wichita, Kans. 67216

Filed May 29, 1984, Ser. No. 614,526
Int. Cl.[3] B32B *35/00*
U.S. Cl. 156—94 9 Claims

1. A method of repairing breaks in sheet members resulting in a crack between the spaced apart portions of the members, said method comprising the steps of:

coating the crack defining edges of said portions with a liquid cyanoacrylate adhesive;

immediately thereafter and before said coating is dry, filling the crack with particulate material;

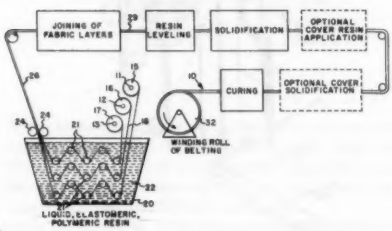
soaking the particulate material in the crack with said liquid cyanoacrylate adhesive; and

drying said adhesive to form a hardened filler in the crack and adhered to said edges, thereby joining the portions.

4,526,637
METHOD OF MAKING CONVEYOR BELT

Barry W. Long, Copley, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 29, 1982, Ser. No. 344,109
Int. Cl.[3] B32B *5/28;* B65G *15/34*
U.S. Cl. 156—137 9 Claims



1. A method of manufacturing belting, comprising the following sequence of steps:

(a) providing at least two individual layers of fabric, one of the fabric layers is a woven cloth and another is a non-woven fabric,

(b) saturating the individual fabric layers with a liquid elastomer-forming polymeric resin, selected from the group consisting of polyvinylchloride and polyurethane,

(c) pressing the saturated fabric layers together and removing the excess of liquid polymeric resin,

(d) tensioning the fabric layers in a lengthwise direction an amount greater than that applied to them during saturation,

(e) joining the saturated fabric layers while the resin is still liquid by a multiplicity of reinforcing elements which extend in a direction of the thickness of the fabric layers,

(f) tensioning the joined fabric layers an amount greater than that applied to them during joining,

(g) curing the polymeric resin

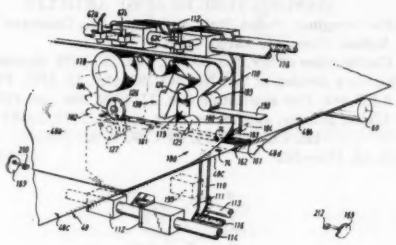
4,526,638
APPARATUS AND METHOD FOR JOINING WEBS

Trevor F. Clements, Oldham, England, assignor to Hurley Moate Engineering Company Limited, Oldham, England

Filed Jul. 14, 1983, Ser. No. 513,910
Claims priority, application United Kingdom, Jul. 17, 1982, 8220797; Feb. 28, 1983, 8305521
Int. Cl.[3] B31F *5/00*
U.S. Cl. 156—159 17 Claims

1. A method of joining two webs of flexible material comprising bringing the webs into overlapping relationship, cutting the overlapped webs to provide two portions of each web respectively on opposite sides of the cut, removing one of the overlapped portions of one of the webs from the region of the cut so as to leave cut edges of the webs in abutting engagement across the width of the webs, and applying a length of adhesive material to marginal portions of the webs adjacent the cut to effect the join, the webs being held stationary during the cutting, removing and applying steps, said applying step comprising moving a store of said adhesive material across the webs, sensing a web side edge, applying said adhesive material in response to sensing of said web edge, sensing the other web side edge, and cutting the adhesive material in response to sensing of said other web edge.

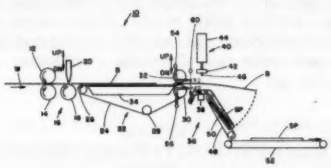
4. Apparatus for joining two webs of flexible material comprising means for holding the webs in stationary overlapping relationship, means for cutting the overlapped webs so as to place a cut edge of one web in abutting engagement with a cut edge of the other web across the width of the webs, means for removing one of the webs from the region of the cut so as to expose the marginal portion of said one web, and means for applying a length of adhesive material to marginal portions of the webs adjacent the cut, the apparatus further comprising means for moving the web cutting means and the applying means across the webs, the applying means including means for severing the adhesive material, means for sensing a web side edge and for operating the severing means at a predetermined relative transverse position of said webs and said cutting means.



4,526,639
APPARATUS AND METHOD FOR FORMING AND STACKING PLASTIC BAGS

George J. Reimann, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,175
Int. Cl.[3] B31B *1/86*
U.S. Cl. 156—182 20 Claims



1. An apparatus for sequentially forming and stacking a plurality of plastic bags severed from a continuous web of a layflat tubular plastic film material, comprising:

(a) means for intermittently feeding predetermined lengths of said plastic film; heated means for severing said film into said lengths and concurrently forming transverse hot seals across said severed lengths to provide sealed plastic bags;

(b) means receiving said sealed plastic bags from said severing and sealing means, said receiving means comprising

intermittently traveling perforate conveyor belt means supporting said sealed bags, and vacuum generating means below said belt means for retaining said sealed bags on said belt means and concurrently cooling said hot seals;

(c) bag stacker means for stacking successive plastic bags discharged from said perforate conveyor belt means and adhering said stacked bags to each other;

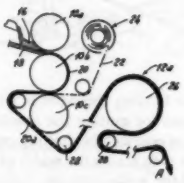
(d) and conveying means for transporting said stacked and adherent plastic bags from said bag stacker means.

4,526,640

EQUIPMENT FOR PRODUCING CONTINUOUS TAPE OF RUBBERY VULCANIZABLE MATERIAL FOR THE MANUFACTURE OF HOSE ARTICLES

Alfio Deregibus, Padua, Italy, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 53,169, Jun. 29, 1979, abandoned, which is a division of Ser. No. 841,790, Oct. 13, 1977, Pat. No. 4,173,444. This application Oct. 22, 1980, Ser. No. 199,171
Claims priority, application Italy, Apr. 5, 1977, 23157 A/77
Int. Cl.³ B29B *19/00;* **C09J** *5/02, 5/00*
U.S. Cl. 156—242 **4 Claims**



1. A method for the continuous production of running lengths of vulcanized compound reinforced tape for use in the making of a hose product, comprising a first step of passing amorphous vulcanizable rubber material at a high temperature, suitable for calendering of that material, through a first calender nip formed between heated counter-rotatable rolls of a first calender to form said material into a tape, a second step of thereafter passing said tape and preselected fabric material through a second calender nip formed between heated counterrotatable rolls of a second calender to reduce the tape to a predetermined thickness and form a compound tape, and thereafter a third and separate step of plural and successive stages of cooling said compound tape by passing it in conductive cooling contact with a respective major arcuate portion of an exterior cooling cylindrical surface of each of a series of rotatable cooling cylinders, said major arcuate portions of said series of cylinders being contacted alternately by first and second faces of the compound tape continuously laminating said tape and said fabric in said-calender means to form a compound reinforced tape and, after cooling said tape, vulcanizing said cooled tape to provide a vulcanized compound reinforced tape.

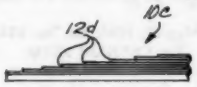
4,526,641

METHOD OF MAKING PEELABLE NON-METALLIC SHIMS

Matthias P. Schriever, Kent, and Chun-Ming Wong, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 349,561, Feb. 17, 1982,. This application Sep. 6, 1983, Ser. No. 529,785
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—247 **2 Claims**

1. A method of preparing a shaped shim, with steps comprising: determining the required shape for a shim to fill a void between structural members; selecting peelable shim stock of a laminate of polyimide films adhered together with a peel strength of 1 to 4 pounds per inch of width; scribing the polyimide film; peeling back the film and tearing it off at the scribed



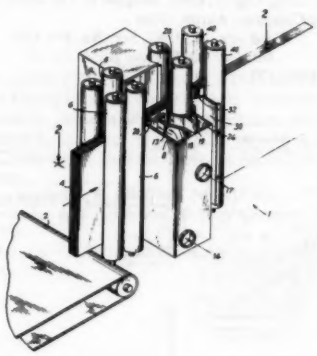
mark; and repeating the scribing, peeling and tearing thereby imparting a taper to the surface.

4,526,642

FLYLEAF HEAT SEALER

Robert A. Caughey, Antrim, N.H., assignor to permaTek, Inc., Las Vegas, Nev.

Filed Dec. 6, 1982, Ser. No. 447,273
Int. Cl.³ B42C *9/00, 13/00;* **C09J** *5/06*
U.S. Cl. 156—311 **11 Claims**



1. Apparatus for adhering a flyleaf coated on one side with a hot melt adhesive to the exposed outer sheets of a book block insert where the flyleaf is wrapped about and overlies the spine and outer sheets of said book block insert forming a book unit with the outer surface of the flyleaf exposed, the apparatus operable with a source of heated air, a source of cooler air, and in-feed transport means delivering said book units, comprising: a housing defining therein a heating chamber with an entrance for receiving said book units, a cooling chamber with an exit for discharging said book units, first means for flowing heating air from said source of heated air into said heating chamber to impinge on the exposed outer surface of the flyleaf and thence to exit from said heating chamber, a pair of cooling rollers rotatably mounted in said cooling chamber defining between them a nip for receiving each book unit in pressure contact from said first means, second means for flowing cooler air from said source of cooler air into said cooling chamber to impinge on exposed surfaces of said cooling rollers and to exit said cooling chamber, and third means for transporting said book units through said housing.

8. A method for adhering a flyleaf coated on one side with a hot melt adhesive to the exposed outer sheets of a book block insert where the flyleaf is wrapped about and overlies the spine and outer sheets of said book block insert forming a book unit with the outer surface of the flyleaf exposed, the method operable with a source of heated air, a source of cooler air, and in-feed transport means delivering said book units, the method comprising: applying a flow of heated air to impinge on said exposed flyleaf surfaces and thereby heating said adhesive to its melting point, subsequently applying pressure to and cooling said exposed outer surfaces of said flyleaf until said adhe-

sive has a temperature below its melting point by passing said heated book unit between and in pressure contact with a pair of cooling rollers.

4,526,643

DRY ETCHING APPARATUS USING REACTIVE IONS

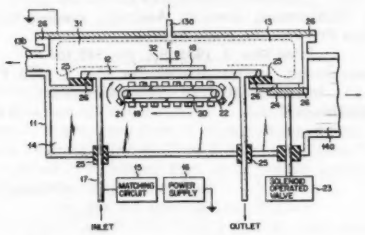
Haruo Okano, Yokohama; Takashi Yamazaki, Kawasaki; Yasuhiro Horiike, Tokyo, and Hiromichi Horie, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 8, 1984, Ser. No. 578,082

Claims priority, application Japan, Mar. 24, 1983, 58-49142

Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—345 **19 Claims**



1. A dry etching apparatus using reactive ions, comprising:

a housing means for etching a workpiece, said housing means being provided with a cathode electrode on which the workpiece is mounted, and an anode electrode arranged opposite the cathode electrode;

a means for supplying an etching gas into and exhausting the same from the housing means;

a means for applying a high frequency voltage between the cathode and the anode electrodes to produce a plasma;

a magnetic means arranged outside of the housing means for generating magnetic fields on the cathode electrode, said magnetic means including a plurality of magnets which are so arranged, with a certain clearance interposed between the magnets, as to form an endless track; and

a means for moving the magnets along the endless track, to successively oppose each of the magnets to the cathode electrode, in such a way that the magnetic fields may be moved on the cathode electrode.

4,526,644

TREATMENT DEVICE UTILIZING PLASMA

Yasutomo Fujiyama, Kawasaki, and Osamu Kamiya, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

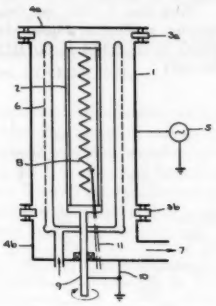
Filed Apr. 4, 1984, Ser. No. 596,804

Claims priority, application Japan, Apr. 5, 1983, 58-59672

Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—345 **3 Claims**

1. A treatment device utilizing plasma which performs treatment by exposing a material to be treated to a plasma atmosphere formed by converting at least either one of fluorine and a fluorine compound into gas plasma, which device comprises a structural member for forming the space for maintaining said plasma atmosphere, which is constituted of a stainless steel structure member coated on its surface exposed to said plasma



atmosphere with a metal film which can difficultly form a fluoride.

4,526,645

LABELLING EQUIPMENT

Martin D. Malthouse, Toronto, and Heinz K. Groeger, Thornhill, both of Canada, assignors to Associated Packaging Equipment Corp. Ltd., Markham, Canada

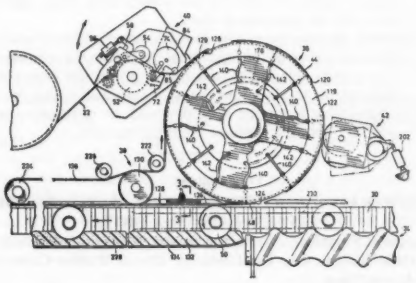
Division of Ser. No. 98,085, Nov. 28, 1979, Pat. No. 4,323,416.

This application Oct. 29, 1981, Ser. No. 316,266

Claims priority, application Canada, Dec. 5, 1978, 317428; Nov. 22, 1979, 340448

Int. Cl.³ B65C *9/04, 9/26*

U.S. Cl. 156—350 **28 Claims**

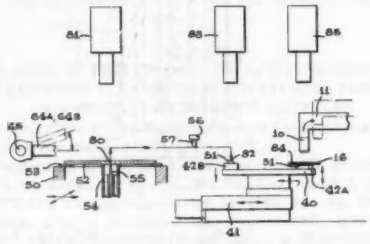


1. A labelling machine including a label carrier having a plurality of support portions each operable to receive and retain a label and move said label along a predetermined path at a predetermined speed, a container feeder operable to direct containers to a position adjacent said predetermined path, and a drive system including transfer means to bring a portion of said label into contact with said container and drive means operable upon the container during transfer of said portion of the label to said container to move said container at a peripheral speed greater than said predetermined speed to cause relative sliding movement between said label and said support portion whereby upon contact of said label with said container, said label is drawn under tension from said support portion and onto said container.

4,526,646
INNER LEAD BONDER

Yasunobu Suzuki; Seiichi Chiba, and Akihiro Nishimura, all of Tokyo, Japan, assignors to Shinkawa Ltd., Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,207
Claims priority, application Japan, Mar. 3, 1983, 58-35584
Int. Cl.³ B65G *25/00;* **B32B** *31/00;* **B23P** *19/00;* **B44C** *1/00*
U.S. Cl. 156—361 **11 Claims**



1. An inner lead bonder for bonding leads of a lead frame carried on a film carrier to a die of the type having a plurality of bonding pads when said die is at a bonding position, said inner lead bonder characterized by:

a rotary table having said bonding position located thereon and a die positioning spot angularly displaced from said bonding position, said rotary table being arranged and configured such that said bonding position and said die positioning spot can be interchanged by rotating said table;

a means for sensing the position of said die when said die is located at said die positioning spot;

a means for sensing the position of said lead frame on said film carrier;

a means for moving said film carrier with said lead frame thereon relative to said bonding position in response to the sensed position of said die and the sensed position of said lead frame on said film carrier when said table is rotated to interchange said bonding position and said die positioning spot; and p1 a means for positioning said die in XY direction as well as θ direction said rotary table when said die is at said die positioning spot;

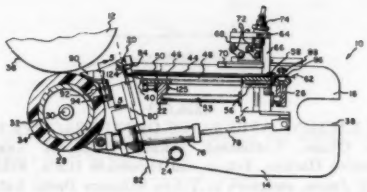
whereby in response to the sensed position of the die and the sensed position of the lead fame, the means for moving the film carrier relative to said bonding position moves said film carrier to align said die with said lead frame as said rotary table is rotated such that said die positioning spot and said bonding position are interchanged.

4,526,647
APPARATUS FOR FEEDING STRIP MATERIAL FOR APPLICATION TO A DRUM

Steven J. Portalupi, Akron, and Robert S. Riggs, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 4, 1983, Ser. No. 520,487
Int. Cl.³ B29H *17/10;* **B65H** *17/08*
U.S. Cl. 156—406.4 **12 Claims**

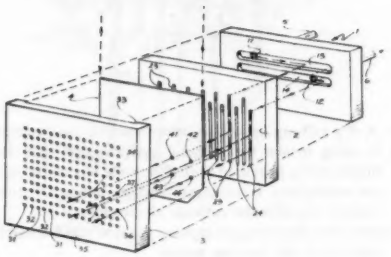
1. Apparatus for feeding a strip of flexible material for application to a drum surface comprising a supporting structure having an applicator roll for positioning adjacent said drum surface, a shuttle casing slidably mounted on said structure for movement from a first position spaced from said applicator roll to a second position in close proximity to said applicator roll, a shuttle finger for supporting said strip connected to said shuttle casing for sliding movement relative to and with said shuttle casing, clamping means movable with said shuttle finger for clamping said strip to said shuttle finger, means for moving said shuttle casing and said shuttle finger between said first position and said second position, stop means for preventing additional movement of said casing beyond said second position and release means for permitting additional sliding movement of said shuttle finger separately toward said applicator roll to a third position for extending a tongue portion of said strip onto said applicator roll.



4,526,648
AIRJET LABEL APPLICATOR

Henry Tochtermann, Beecroft, Australia, assignor to Video Design Pty. Ltd., Beecroft, Australia

Filed Mar. 1, 1984, Ser. No. 585,104
Claims priority, application Australia, Mar. 2, 1983, PF8265
Int. Cl.³ B65C *9/14, 9/28;* **B65H** *29/24*
U.S. Cl. 156—497 **9 Claims**



1. A multi-outlet adapter for conversion of one source of pressure and one source of vacuum to two respective sets of outlets each said set having a multiplicity of openings, said adapter comprising three abutting blocks having opposed mating surfaces, said pressure and vacuum sources being connected to one surface of said first block other than the mating surface of said first block, said first block mating surface having a pair of first depressions therein extending substantially in a first direction, each said first depression communicating directly to a connection of a corresponding one of said sources; one mating surface of said second block having two sets of apertures therein with each set having a plurality of apertures, the apertures of each said set of apertures all communicating with a corresponding one of said first depressions, the other mating surface of said second block having two sets of second depressions therein each of which correspond to, and communicate with, one of said sets of apertures, each set of second depressions having a plurality of said second depressions which each extend in a second direction substantially misaligned with said first direction; and said third block having an array of said openings therethrough at predetermined locations with each communicate the mating surface of said third block with another surface of said third block, at least some of said openings being aligned with said second depressions of one said set of second depressions and the remainder of said openings being aligned with said second depressions of the other set of said second depressions, said some openings constituting one said set of outlets and said remainder of said openings constituting the other said set of outlets.

4,526,649

METHOD OF MOLDING BONDED PARTS WITH SILICON CARBIDE SURFACES

Ashok K. Gupta; Ernö Gyarmati, both of Jülich; Rudolf Münzer, Herzogenrath, and Aristides Naoumidis, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Mar. 29, 1984, Ser. No. 594,571

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311553

Int. Cl.[3] B44C *1/22;* C03C *15/00, 25/06;* C03B *29/00*

U.S. Cl. 156—629 23 Claims

1. Method of bonding together molded parts, composed of silicon carbide at least on and near their surfaces, at respective silicon carbide joining surfaces thereof, comprising

roughening the surfaces to be joined up to a depth of at least 100 μm;

loading the pores of the roughened zone by carbon coked in the pores and

infiltrating liquid silicon into the joint converting the carbon to silicon carbide at a temperature between 1500° and 2000° C.

4,526,650

METHOD FOR REGENERATING PICKLING ACIDS

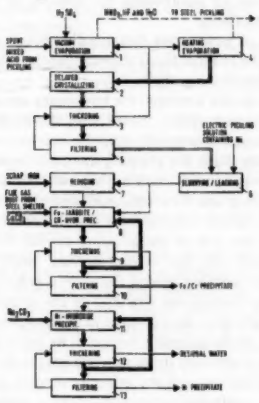
Seppo I. Blomquist, Tornio; Markku T. Saarela, Kokkokangas; Hannu J. Pouru, Pori; Bror G. Nyman, Vanha-Ulvila; Kaj-Henrik Lindroos, Helsinki; Timo T. Koivunen, Vanha-Ulvila, and Sigmund P. Fugleberg, Pori, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jan. 23, 1984, Ser. No. 572,945

Claims priority, application Finland, Jan. 25, 1983, 830239

Int. Cl.[3] C23F *1/00;* B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—642 9 Claims



1. A method for regenerating pickling acids containing iron, chrome and nickel, and nitric and hydrofluoric acid by admixing the pickling acid to 60% sulphuric acid and by evaporating the acids weaker than sulphuric acid and by recovering said evaporated acids from a condenser and by continuously crystalling the metal salts dissolved in the sulphuric acid in two stages and by converting said crystallized metal salts into a scarcely soluble ferro-chrome precipitate while the nickel remains in solution, comprising promoting the crystallization, by dividing the metal salt into two parts: a main line and a side line, at least part of the metal salt being crystallized in the side line and the crystals being combined with the crystallizing stage of the main line, and from the acid, soluble sulphate precipitate produced the iron being precipitated in the form of jarosite and the chrome as hydroxide.

4,526,651

PROCESS FOR OXYGEN BLEACHING PAPER PULP USING MELAMINE AS A VISCOSITY STABILIZER

G. Graham Allan, Seattle, Wash., assignor to Melamine Chemicals, Inc., Donaldsonville, La.

Continuation-in-part of Ser. No. 537,876, Sep. 30, 1983, Pat. No. 4,487,656. This application Sep. 24, 1984, Ser. No. 654,283

Int. Cl.[3] D21C *9/10*

U.S. Cl. 162—65 4 Claims

1. A process for maintaining pulp viscosity while enhancing brightness during the bleaching stages of pulp preparation in paper manufacture comprising: adding an effective amount of melamine to paper pulp prior to an oxygen bleaching stage of paper pulp manufacture, wherein the melamine is added in an amount effective to maintain the pulp viscosity while enhancing the brightness during said oxygen bleach stage.

4,526,652

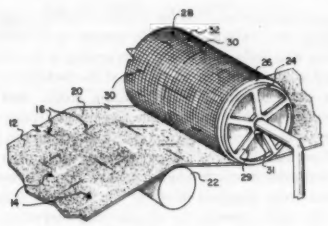
DANDY ROLL FOR MANUFACTURING PAPER HAVING SIMULATED OXFORD CLOTH WATERMARK AND RELATED METHOD FOR PAPERMAKING

James R. Waters, Appleton, Wis., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 17, 1983, Ser. No. 553,003

Int. Cl.[3] D21F *1/46*

U.S. Cl. 162—110 12 Claims



1. A dandy roll useful in manufacturing paper having a watermark design which simulates oxford cloth, said dandy roll comprising a cylindrical wire screen mounted upon a cylindrical framework, the mesh of said screen being between 15 and 25, said screen having a plurality of substantially straight electro wire segments soldered to the outer face thereof, said soldered wires being oriented parallel to the wires forming said screen, said screen further having a plurality of substantially straight pockets formed therein, said pockets being formed by removing selected segments of the wires forming said screen, said soldered wires and said pockets being randomly positioned on said dandy roll so as to provide watermarks which simulate the appearance of oxford cloth when said dandy roll is used in papermaking.

7. In a papermaking process which comprises contacting damp paper stock with a dandy roll to form a watermark in said stock, said dandy roll comprising a cylindrical framework having a cylindrical wire screen mounted thereon, the improvement wherein:

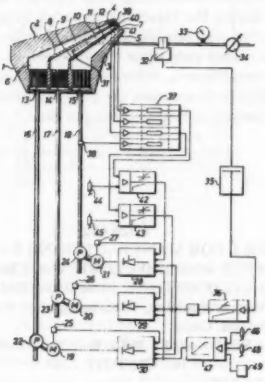
the mesh of said screen is between 15 and 25, a plurality of substantially straight electro wires are soldered to the surface of said screen and said screen has formed therein a plurality of substantially straight pockets, said pockets being formed by removing selected segments of the wires forming said screen, said pockets and said soldered wires being oriented parallel to the wires forming said screen and being randomly positioned on said dandy roll so as to provide a watermark which simulates oxford cloth.

4,526,653

CONTROL SYSTEM FOR A MULTILAYER HEADBOX USING AN ULTRASONIC TRANSDUCER

Karl J. L. Andersson, Karlstad, Sweden, assignor to KMW Aktiebolag, Karlstad, Sweden

Filed Sep. 28, 1982, Ser. No. 426,107
Claims priority, application Sweden, Dec. 1, 1981, 8107154
Int. Cl.[3] D21F 1/06, 11/04
U.S. Cl. 162—259 8 Claims



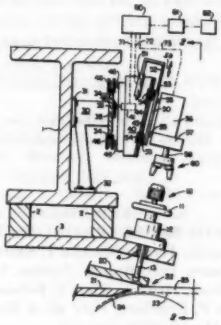
1. In a multilayer headbox for a paper machine, said headbox comprising two walls arranged in spaced apart relation from each other and defining a space converging in the direction of flow, said walls having lip members at the headbox outlet that define a slice opening for discharging stock, said headbox additionally including at least one partition arranged in said space for forming respective channels converging in the direction of flow and which in number are one more than the number of partitions, through which channels respective stocks are conducted from separate inlets in the headbox to discharge slots at the slice opening for discharging therefrom a corresponding number of layer-forming stock jets, each channel being connected to a respective feed pipeline for stock supply, each feed pipeline including a respective pump driven by a motor, the speeds of which motors are controlled by respective individual speed regulator units, the combination with said multilayer headbox of an improved control system for accurately controlling the thickness of the layers formed by said headbox, said control system comprising a first controller means arranged to emit an output signal as a function of a possible deviation of a quantity indicating an operational condition of the stocks inside the headbox from a setpoint for such quantity, which output signal is transmitted to all of said speed regulator units in order to control the speeds of the motors synchronously and thus, by means of the pumps, synchronously alter the stock supply to the channels, ultrasonic transducer means arranged at the slice opening for transmitting an ultrasonic pulse through the stock to an opposed channel forming surface to thereby obtain a signal representative of the distance between two channel-forming surfaces in at least one channel, an electronic measuring unit connected to said ultrasonic transducer means to convert said signal into a distance value, and at least one other controller means connected to said electronic measuring unit to receive said measurement signal representing the distance value obtained between said two channel-forming surfaces in said at least one channel and operable to compare the actual value with a setpoint and, in response to a possible deviation, to emit an output signal to one of said speed regulator units in order to control the speed of the pump motor and thereby vary the stock supply to one of said channels relative to the stock supply to the adjacent channel.

4,526,654

APPARATUS FOR CONTROL OF THE SLICE OPENING ON A SLICE LIP ON A HEADBOX

Bengt A. Johansson, Skellefteå, and Peter Brodin, Mellerud, both of Sweden, assignors to AccuRay Corporation, Columbus, Ohio

Filed Aug. 12, 1983, Ser. No. 522,523
Claims priority, application Sweden, Aug. 13, 1982, 8204698
Int. Cl.[3] D21F 1/02; D21C 1/06
U.S. Cl. 162—259 8 Claims



1. Apparatus for controlling the opening of the slice of a headbox, comprising

a plurality of jackscrews that are distributed across and act against the control lip of the slice, each jackscrew having a rotatable driving shaft,

a gripping device arranged for temporary connection to any one of the jackscrews, the gripping device being rotatable and arranged to coaxially grip the end part of the particular driving shaft, the gripping device comprising a plurality of hinged levers each having two arms, of which one is a gripping jaw for interaction with the periphery of the end part on the driving shaft and the other is directed in towards the axis of the gripping device to achieve joint action with the end of the driving shaft, a tensioning means for working against the second arm to urge it in the direction towards the free end of the gripping device so that the gripping jaws diverge in the direction towards the free end of the gripping device in its unloaded state,

a remotely controlled drive mechanism for driving the particular jackscrew via the gripping device, and

a remotely controlled positioning device arranged to move the gripping device to connect to any one of the jackscrews, the positioning device including a first carriage which supports a second carriage for the gripping device and the drive mechanism,

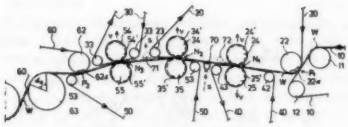
the first carriage allowing movement of the gripping device to a position in axial alignment with and axially spaced from the end part of the driving shaft of any one of the jackscrews,

the second carriage allowing axial movement of the gripping device from the axially spaced position into a position for gripping engagement with the end part of the driving shaft, whereby the end part of the shaft forces the second arms of the gripping device away from the free end of the gripping device, thereby causing the first arms of the gripping device to converge on the driving shaft and grip the periphery of the same in order to effect its rotation.

4,526,655
PRESS SECTION WITH SEPARATE PRESS NIPS IN A PAPER MACHINE

Mikko Karvinen, Vihtavuori, and Jorma Laapotti, Jyväskylä, both of Finland, assignors to Valmet Oy, Finland

Filed Sep. 12, 1983, Ser. No. 531,297
Claims priority, application Finland, Sep. 15, 1982, 823187
Int. Cl.³ D21F *3/04*
U.S. Cl. 162—360.1 **14 Claims**



1. In a press section of a paper machine including, in the direction of the passage of the web through the press section, at least first, second and third successive press nips for removing water from the web to a substantial extent, each of said three press nips being a separate press nip, each press nip formed by its own separate pair of press rolls, and wherein each of said three press nips has a pair of fabrics passing therethrough so that the web is situated between two fabrics as it passes through each of said three press nips, and wherein dewatering takes place through both faces of the web in at least said first one of said three nips in the direction of web passage, said first press nip being formed between two open-faced rolls, and wherein said second and third press nips are formed between an open-faced roll and one of an open-faced roll and a smooth-faced roll, and wherein said press section includes a first upper fabric and a first lower fabric, one of said first upper and lower fabrics acting as a pick-up fabric onto which the web is transferred from a forming wire of the paper machine, the improvement comprising:

said press section includes two upper fabrics and two lower fabrics constituted by first upper and lower fabrics and second upper and lower fabrics in the direction of web run, and wherein

said first upper and first lower fabrics are water-receiving press fabrics adapted to receive water removed from the web, and wherein one of said first upper and first lower fabrics constitutes a press fabric only in said first press nip and wherein the other of said first upper and first lower fabrics constitutes a press fabric both in said first press nip and in said second press nip;

wherein one of said second upper and second lower fabrics is a water-receiving press fabric adapted to receive water removed from the web, and wherein the other of said second upper and second lower fabrics is a substantially non-water-receiving transfer fabric; and

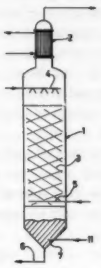
wherein said transfer fabric constitutes means for transferring the web after said third nip as a closed draw to the drying section of the paper machine which follow the press section.

4,526,656
MONOMERIC VINYL CHLORIDE STRIPPING TOWER

Hiroshi Okada, Nagoya; Hideyuki Itagaki, Tokai; Takehiko Kano, and Seiichi Masuko, both of Takaishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,388
Claims priority, application Japan, Sep. 27, 1982, 57-166655
Int. Cl.³ B01D *3/14*
U.S. Cl. 202—158 **3 Claims**

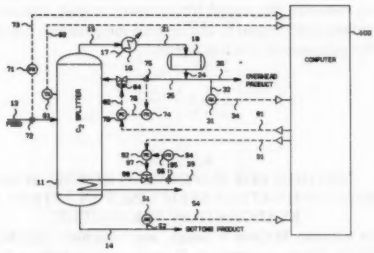
1. A monomeric vinyl chloride stripping tower comprising a tower, a packing filling at least part of the internal volume of the tower and having elements designed, dimensioned and arranged to remove monomeric vinyl chloride from a suspension or emulsion of vinyl chloride resin, the tower also having means positioned and arranged for precluding foaming, the foam preclusion means comprising a condenser directly connected to an upper portion of the tower for condensing water and returning the condensed water to the tower, thereby precluding excessive foaming within the tower.



4,526,657
CONTROL OF A FRACTIONAL DISTILLATION PROCESS

James W. Hobbs, and Mary M. Halliday, both of Sweeny, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 29, 1982, Ser. No. 437,703
Int. Cl.³ B01D *3/42*; G06F *15/00*
U.S. Cl. 203—3 **10 Claims**



6. A method for controlling a fractional distillation process utilized to separate first and second components contained in a feed stream flowing to a fractional distillation column, wherein a heating fluid is introduced into said fractional distillation column to effect said separation, wherein said first component is principally removed from said fractional distillation column as an overhead vapor stream, wherein said overhead vapor stream is at least partially condensed with a first portion of the condensate being returned to an upper portion of said fractional distillation column as an external reflux stream and a second portion of said condensate being removed from said fractional distillation process as an overhead proudct, and wherein said second component is principally removed from said fractional distillation column as a bottoms product, said method comprising the steps of:

establishing a first signal which is representative of the concentration of said first component in said bottoms product stream;

establishing a second signal which is representative of the concentration of said second component in said overhead product stream;

establishing a first control signal representative of the desired flow rate of said external reflux stream, wherein said first control signal is periodically increased or decreased

by a fixed increment or left unchanged depending upon the relationship between the actual concentration of said first component in said bottoms product stream as represented by said first signal and a high limit and low limit for the actual concentration of said first component in said bottoms product stream and depending upon the relationship between the actual concentration of said second component in said overhead product stream as represented by said second signal and high and low limits for the actual concentration of said second component in said overhead product stream;

manipulating the flow rate of said external reflux in response to said first control signal so as to maintain the actual external reflux flow rate substantially equal to the desired external reflux flow rate as represented by said first control signal;

establishing a second control signal representative of the desired temperature at a selected point in said fractional distillation column, wherein said second control signal is periodically increased or decreased by a fixed increment or is left unchanged depending upon the relationship between the actual concentration of said first component in said bottoms product stream as represented by said first signal and said high and low limits for the actual concentration of said first component in said bottoms product stream and depending upon the relationship between the actual concentration of said second component in said overhead product stream as represented by said second signal and said high and low limits for the actual concentration of said second component in said overhead product stream; and

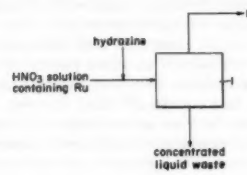
manipulating the flow rate of heat to said fractional distillation column in response to said second control signal so as to maintain the actual temperature at said selected point substantially equal to the desired temperature represented by said second control signal.

4,526,658

METHOD FOR IMPROVING RUTHENIUM DECONTAMINATION EFFICIENCY IN NITRIC ACID EVAPORATION TREATMENT

Kanya Kubota; Hajimu Yamana, and Seiichiro Takeda, all of Ibaraki, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,391
Claims priority, application Japan, Nov. 15, 1982, 57-199892
Int. Cl.³ G21F *9/14*
U.S. Cl. 203—13 **3 Claims**



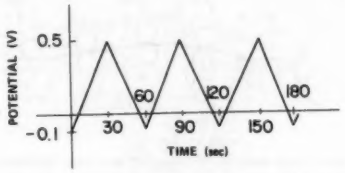
1. A method for improving ruthenium decontamination efficiency in a nitric acid recovery system in which a nitric acid solution containing ruthenium is subjected to a evaporation treatment in a nitric acid evaporator, characterized in that said evaporation treatment of the nitric acid solution in said evaporator is carried out in the presence of hydrazine in a concentration of 20 to 5000 mg per liter of the solution in said evaporator.

4,526,659

METHOD OF ELECTRODEPOSITING HEXACYANO-COBALT IRON COMPLEX

Teruko Yoshimoto, Fujisawa; Mikio Kawai, Yokohama, and Hitoshi Kunimi, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 28, 1984, Ser. No. 655,557
Claims priority, application Japan, Oct. 6, 1983, 58-185837
Int. Cl.³ C25B *1/00*
U.S. Cl. 204—56 R **7 Claims**



1. A method of electrodepositing a hexacyano-cobalt iron complex expressed by the general formula $Fe_x[Co(CN)_6]_y$, where $3 \leqq x \leqq 4$ and $2 \leqq y \leqq 3$, by electrolytic reduction from an aqueous mixed solution of an iron(III) salt and potassium cobalt hexacyanide,

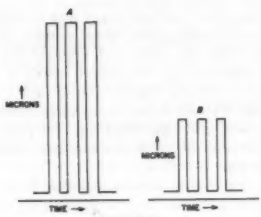
characterized in that during electrolytic reduction the cathode potential is periodically increased and decreased over a predetermined range.

4,526,660

ANODIZING METHOD

Eliseo B. Garriga, Pradera No. 10, Pedregal de San Angel, Mexico

Filed Jun. 22, 1984, Ser. No. 623,790
Claims priority, application Mexico, Feb. 6, 1984, 200240
Int. Cl.³ C25D *11/08, 11/10*
U.S. Cl. 204—58 **8 Claims**



1. An improvement in an anodizing process, of the kind used for the anodic oxidation of aluminum by means of an electrolyte of low dissolving power, comprising preparing an electrolyte on the basis of a sulfuric acid solution of a concentration which varies between 50–250 g/ltr; a booster agent selected from the group consisting of boric acid, glyoxal, triethanolamine, ethylene glycol, propylene glycol and glycerin, in a concentration between 0.1 and 20 g/ltr, oxalic acid in a concentration of 0.1 to 10 g/ltr and formaldehyde with a concentration of 0.1 to 40 g/ltr; and treating the aluminum in question with the electrolyte thus formed, by applying a current at 10–30 volts and at a temperature of 25°–45° C.

4,526,661

ELECTROCHEMICAL HYDROGENATION OF NICOTINAMIDE ADENINE DINUCLEOTIDE

Eberhard Steckhan, Meckenheim, and Rainer Wienkamp, Muenster, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Del.X

Filed May 31, 1983, Ser. No. 499,261

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221339

Int. Cl.[3] C25B *3/04*

U.S. Cl. 204—73 R 3 Claims

1. In an electroylsis process wherein nicotinamide adenine dinucleotide (NAD^+) is hydrogenated to (NADH) by an indirect electrochemical reduction in which the electrolysis is carried out in the presence of an electron carrier, the improvement which comprises: employing as the electron carrier a metal complex having a reduction potential which is not more negative than −1.3 volt, based on a reference electrode consisting of an Ag/AgCl electrode in saturated aqueous potassium chloride, and wherein the electrolysis is carried out in a cell at a temperature of from about 10° to 70° C., a pH of from about 5 to 10 and a current density of from 1 to 100 mA/cm^2.

4,526,662

PROCESSES FOR THE RECOVERY OF CYANIDE FROM AQUEOUS THIOCYANATE SOLUTIONS AND DETOXICATION OF AQUEOUS THIOCYANATE SOLUTIONS

John J. Byerley, 154 Chelford Crescent, and Kurt Enns, 345 Dale Crescent, both of Waterloo, Ontario, Canada

Filed Sep. 9, 1982, Ser. No. 416,239

Int. Cl.[3] C25B *1/03, 1/22*

U.S. Cl. 204—86 19 Claims

1. A process for the recovery of cyanide from thiocyanate, said process comprising introducing an aqueous solution containing thiocyanate into a suitable electrochemical reactor, applying a direct current electrical potential to said reactor, carrying out a reaction under controlled conditions around room temperature for an appropriate time period to convert sufficient thiocyanate to cyanide and recovering the cyanide so formed.

4,526,663

METHOD FOR ELECTROLYSIS OF AQUEOUS ALKALI METAL CHLORIDE SOLUTION

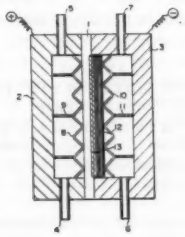
Mitsuo Yoshida; Hiroyoshi Matsucka, and Hajime Munekuni, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 157,163, Jun. 6, 1980, abandoned. This application Aug. 24, 1981, Ser. No. 295,389

Claims priority, application Japan, Jun. 7, 1979, 54-70544; Jun. 7, 1979, 54-70545

Int. Cl.[3] C25B *1/34*

U.S. Cl. 204—98 2 Claims



1. In a process for the electrolysis of an aqueous alkali metal chloride solution in an electrolytic cell divided by a cation-exchange membrane, through which neither liquid nor gas can substantially pass, into an anode compartment and a cathode compartment, respectively, to produce alkali metal hydroxide and discharging hydrogen gas and chlorine gas from the cathode compartment and the anode compartment, respectively, the improvement which comprises utilizing a cathode which is joined with said cation-exchange membrane throughout one entire side surface thereof wherein said cation-exchange membrane has a powdered cathodic substance uniformly and densely embedded in the cathode side surface of the membrane and positioning and maintaining an anode of porous construction in close proximity to but not in contact with the other side surface of the membrane through which neither liquid nor gas can substantially pass wherein electrolysis is carried out at a high current density of not less than 20 A/dm^2, the concentration of alkali hydroxide in the catholyte is maintained in a range of from 15 to 45% by weight and wherein the oxygen gas content of the chlorine gas is not more than 0.6% by volume.

4,526,664

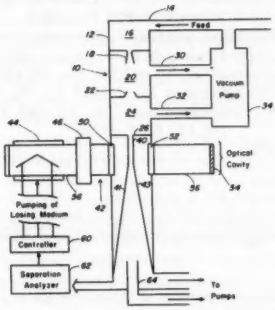
ISOTOPE SEPARATION APPARATUS AND METHOD

Barry J. Feldman, Los Alamos, N. Mex., assignor to The United Sates of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 1, 1974, Ser. No. 457,671

Int. Cl.[3] B01D *59/00*

U.S. Cl. 204—157.1 R 14 Claims



1. An improved method for inducing separation between two isotopes in a molecular beam using a laser emitting a beam of chirped pulses comprising selected wavelengths, the selected wavelengths being those that will be absorbed by unexcited, and will stimulate emission by excited, molecules containing a selected isotope which molecules may occupy any one of a plurality of degenerate energy levels, the method comprising the steps of:

impinging a laser beam of the chirped pulses comprising the selected wavelengths onto the molecular beam at a first angle of incidence and in a first direction to thereby excite molecules in the molecular beam containing the selected isotope, causing such molecules to move essentially in the first direction in response thereto;

impinging a laser beam of chirped pulses comprising the selected wavelengths into the molecular beam in a second direction to cause stimulated emission by the molecules excited by the first direction beam, causing such emitting molecules to move opposite to the second direction; and

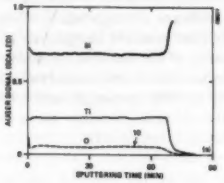
collecting the molecules so moved by excitation and stimulation.

4,526,665

METHOD OF DEPOSITING FULLY REACTED TITANIUM DISILICIDE THIN FILMS

Minas Tanielian, Schaumburg; Scott Blackstone, Mt. Prospect, and Robert Lajos, Crystal Lake, all of Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Aug. 20, 1984, Ser. No. 642,328
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 C **26 Claims**



1. A method of depositing a refractory metal on a surface of a silicon substrate to form a refractory metal silicide comprising the steps of:

heating said surface of said substrate to increase the mobility on the surface of the substrate to an energy level E_s; and

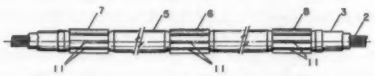
sputtering said substrate with a refractory metal having a kinetic energy E_k whereby the sum of E_k and E_s is greater than the activation energy required for a refractory metal silicide to be formed.

4,526,666

METHOD FOR ELECTRICALLY CONNECTING NON CORRODIBLE ANODES TO THE CORRODIBLE CORE OF A POWER SUPPLY CABLE

Guiseppe Bianchi, Milan, and Gian L. Mussinelli, Como, both of Italy, assignors to Oronzio de Nora, Lugano, Switzerland

Continuation-in-part of Ser. No. 452,268, Dec. 22, 1982, Pat. No. 4,452,683. This application Jul. 7, 1983, Ser. No. 511,399
Claims priority, application Italy, Jun. 23, 1983, 21754 A/83
Int. Cl.³ C23F *13/00*
U.S. Cl. 204—196 **2 Claims**



1. The method for making a sealed electrical connection between anodically insoluble tubular valve metal anodes, coated on their external surface with a non-passivatable and corrosion resistant material, to the corrodible core of a power supply cable insulated with a sheath of elastomeric insulating material comprising:

(a) disposing three bushes of ductile metal over the tubular valve metal anode one of which in a substantially central position with respect to the length of the anode and the remaining two near the two ends of the anode respectively;

(b) passing the power supply cable through the tubular anode until a segment of the cable, previously stripped of its insulating sheath and provided with a split collar of highly conductive metal around the conductive core of the cable and having a thickness substantially similar to the thickness of the sheath is underneath the central bush disposed over the anode;

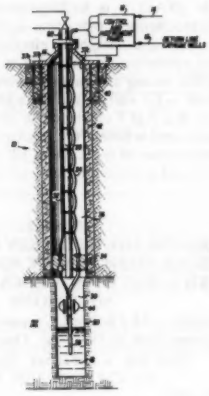
(c) plastically reducing the circumference of the tubular valve metal anode in correspondence of the three externally disposed bushes by cold-heading the valve metal tubular anode respectively around the split collar disposed on the conductive core in correspondence of the central bush and directly around the elastomeric insulating sheath in correspondence of the two bushes near the two ends of the anode.

4,526,667

CORROSION PROTECTION ANODE

Warren E. Parkhurst, 445 Albrecht La., Durango, Colo. 81301, and David Moser, 14276 Holt Ave., Santa Ana, Calif. 92705

Filed Jan. 31, 1984, Ser. No. 575,625
Int. Cl.³ C23F *13/00*
U.S. Cl. 204—196 **9 Claims**



1. A cathodic protection system for protecting a metallic structure from corrosion caused by electrical currents flowing between said metallic structure and surrounding atmosphere, said cathodic protection system comprising:

an electrical anode located in and contained by a hole in the earth so as to be in intimate physical and electrical contact with the surrounding earth defining said hole whereby electrical current can flow freely between the anode and the electrolytes in the earth;

a voltage-impression means for impressing a DC voltage between said metallic structure to be protected and said anode whereby said anode is made to be substantially electrically positive relative to said metallic structure thereby causing current to flow from said anode to said metallic structure through said earth to prevent corrosion on said metallic structure;

said anode comprising a non-ionized metal which exists in a liquid state at the particular pressure and temperature at its location in said hole whereby gravity causes said liquid anode to continually conform to the shape of said earth hole containing it and to be in physical and electrical contact with said earth defining said hole.

4,526,668

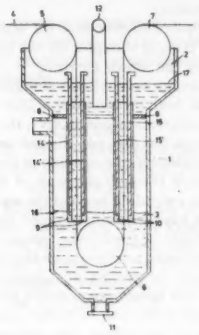
DEVICE FOR THE ELECTROLYTIC TREATMENT OF METAL STRIP

Maurizio Podrini, Via Castel del Rio n. 9, 00127 Roma, Italy

Filed May 7, 1984, Ser. No. 607,445
Claims priority, application Italy, May 16, 1983, 48299 A/83
Int. Cl.³ C25D *17/00*
U.S. Cl. 204—206 **3 Claims**

1. Apparatus for the continuous electrolytic treatment of metal strip of the type having at least two separate vertically superposed chambers connected with each other by means of two vertical ducts the internal walls of which are formed by fixed electrodes, through which the electrolyte flows from the upper chamber into the lower one, and means outside said

ducts for removing electrolyte from the lower chamber and introducing it into the upper chamber, the lower lips of said



ducts extending below the surface of the electrolyte in the lower chamber.

4,526,669

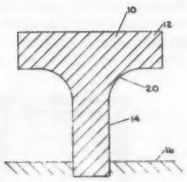
CATHODIC COMPONENT FOR ALUMINUM REDUCTION CELL

Louis A. Joó , Johnson City; Kenneth W. Tucker, Elizabethton, both of Tenn., and Scott D. Webb, Greenville, Miss., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Jun. 3, 1982, Ser. No. 384,594

Int. Cl.³ C25C *3/08;* **C25B** *11/02, 11/12;* **B29C** *25/00*

U.S. Cl. 204—243 R **7 Claims**



1. A monolithic cathodic element for a Hall-Heroult aluminum reduction cell having the approximate configuration of a round toadstool with a substantially horizontal upper round anode-facing surface and a substantially round vertical stem lower support and sole current-carrying means for said anode-facing surface fastened to the floor of said cell wherein the area of said anode-facing surface is greater than the cross-sectional area of said stem support means, said element comprising a refractory hard metal selected from the group consisting of the borides, carbides and nitrides of metals of groups IVA, IVB, VB and VIB of the periodic table produced by filling a mold with particles comprising said refractory hard metal in non-compacted form without either a fugitive binder or sintering aid and heating the filled mold in an inert atmosphere to a sintering temperature for said particles without the application of pressure at any stage of the process.

4,526,670

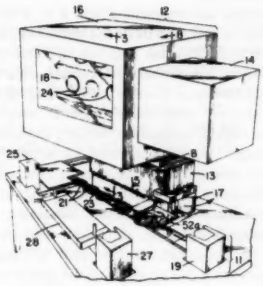
AUTOMATICALLY LOADABLE MULTIFACETED ELECTRODE WITH LOAD LOCK MECHANISM

John G. Hajj, Amesbury, Mass., assignor to LFE Corporation, Clinton, Mass.

Continuation-in-part of Ser. No. 496,445, May 20, 1983, abandoned. This application Mar. 14, 1984, Ser. No. 589,558

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **27 Claims**



1. A gas plasma reaction system for processing semiconductor wafers comprising,

a plasma reactor chamber having a centrally located electrode structure formed of a series of longitudinally extended faces, each of said faces being positioned so that in cross-section the electrode structure has a regular polygonal shape, the faces being extended in a horizontal direction, each of said faces having on its surface a plurality of planar disk shaped electrodes for carrying said semiconductor wafers to undergo the plasma reaction during operation, each of said faces being covered by a generally flat tray member having circular openings therein corresponding to the positions of said electrode disks, each of said trays being hinged for pivotal motion from a first position in close parallel juxtaposition with said electrode face to a second position angularly displaced therefrom,

a loading mechanism disposed generally beneath said reaction chamber, said loading mechanism including a plurality of vertically extending support arms, each of said support arms being configured to carry a semiconductor wafer and formed such that the reactive surface of said semiconductor wafer is not touched by any portion of said vertically extending arm, the number of said vertically extending arms being at least equal to the number of said electrode disks on a single face of said reactor electrode structure,

means for imparting motion to said arms for moving said arms from a position beneath said reactor chamber to a position within said reactor chamber such that each arm is in close juxtaposition to a corresponding one of said disk electrodes, and for thereafter withdrawing said arm from said position in close juxtaposition back to a position beneath said reactor chamber, and

control means for controlling the timing of said load mechanism motion such that said arms are moved into and away from close juxtaposition to said disk electrodes only when said tray members are in said second angularly displaced position.

4,526,671
SURFACE TREATMENT OF ALUMINUM OR ALUMINUM ALLOYS

Hiroshi Watanabe; Isao Shimamura, both of Hiratsuka; Masao Abe, Yokohama, and Masashi Mizusawa, Fujisawa, all of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

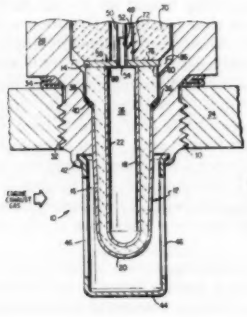
Filed Sep. 16, 1983, Ser. No. 533,533
Claims priority, application Japan, Sep. 24, 1982, 57-167441; Jul. 15, 1983, 58-129143
Int. Cl.³ C25D *11/06*
U.S. Cl. 204—37.6 18 Claims

5. A method according to claim 1 in which the salt in the first solution is selected from the group consisting of calcium nitrate, calcium chloride, calcium acetate, calcium bromide, calcium iodide, barium nitrate, barium chloride, barium acetate, barium bromide, barium iodide, magnesium nitrate, magnesium chloride, magnesium acetate, magnesium bromide, magnesium iodide, magnesium sulfate, strontium nitrate, strontium chloride, strontium acetate, strontium bromide, strongtium iodide, zinc sulfate, zinc nitrate, zinc chloride, zinc acetate, zinc bromide, zinc iodide, lead nitrate, lead chloride, lead acetate, aluminum sulfate, sodium aluminate, aluminum phosphate, aluminum chloride, aluminum oxalate, titanium sulfate and titanium potassium oxalate, and wherein the substance which reacts with the product of the salt is selected from the group consisting of sulfuric acid, phosphoric acid, nitric acid, hydrochloric acid, hydrofluoric acid, sulfamic acid, sodium phosphate, sodium fluoride, ammonium fluoride, sodium hydroxide, potassium hydroxide, sodium carbonate, potassium carbonate, sodium metasilicate, sodium orthosilicate, trisodium phosphate, sodium stannate, potassium stannate, sodium metaborate, sodium pyrolate, ammonia water, oxalic acid, acetic acid, ammonium oxalate, monoethanol amine, diethanol amine, triethanol amine, ethylsulfonic acid, benzoic acid, cresol sulfonic acid, phenol sulfonic acid, toluene sulfonic acid, and sulfosalycilic acid.

4,526,672
OXYGEN SENSOR

Larry T. Reed, Richardson, Tex., assignor to Axia Incorporated, Oak Brook, Ill.

Filed Mar. 23, 1984, Ser. No. 592,626
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—428 6 Claims



1. An exhaust gas sensor for sensing the oxygen content in an exhaust system relative to the oxygen content of air, comprising:

a solid electrolyte sensor element having a generally conical shape with one closed end and one open end surrounded by an annular surface, the sensor element having an outer electrode formed on the exterior surface of the sensor element and an inner electrode formed on the interior surface of the sensor element extending to the annular surface;

a housing for supporting said sensor element and having a conical shoulder;

an electrically conductive seal for sealing engagement between the conical shoulder on the housing and the outer electrode of the sensor element;

a member forming an enclosed elongate hollow tube and a sealing disk, both the elongate hollow tube and the sealing disk being electrically conductive, the hollow tube having an opening at the first end thereof and an opening at the second end thereof, the opening at the second end thereof being a notch through the wall of the hollow tube, the hollow tube extending beyond the notch forming a crimping portion having a wire crimped therein to connect the inner electrode of the exhaust gas sensor to the wire, the sealing disk being positioned on the hollow tube adjacent the first end for sealing engagement with the annular surface of the sensor element for insuring that the only gases present in the interior of the sensor element enter the second end of the hollow tube and pass through the hollow tube to the sensor element;

a cover secured to the housing, the second end of the hollow tube extending out of the cover;

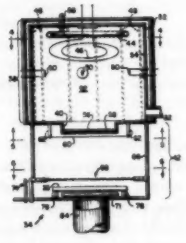
means for urging the sealing disk into contact with the inner electrode so that sealing contact is made between the member and the annular surface of the gas sensor and between the conical shoulder of the housing and outer electrode through said electrically conductive seal; and

a vent cap housing secured to the cover with at least one gap between the cover and vent cap housing to admit air into the interior of the vent cap housing, the second end of the hollow tube being within the interior of the vent cap housing with said at least one gap positioned between said second end of the hollow tube and the electrically conductive seal between the housing and the outer electrode to reduce the potential for contamination of the air within the hollow tube with exhaust gas.

4,526,673
COATING METHOD

Roger G. Little, Bedford, and Stanley R. Shanfield, West Newton, both of Mass., assignors to Spire Corporation, Bedford, Mass.

Division of Ser. No. 423,454, Sep. 24, 1982, Pat. No. 4,440,108.
This application Dec. 19, 1983, Ser. No. 563,096
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 E 13 Claims



1. A process of coating parts comprising:

(a) positioning a plurality of parts on a work transport;

(b) introducing said plurality of parts with said work transport into a coating chamber maintained under vacuum;

(c) subjecting said plurality of parts to cleaning by ion beam milling in an inert gas environment;

(d) providing a negative bias to said plurality of parts in said coating chamber;

(e) exposing said plurality of negatively biased parts within said coating chamber to a beam of ions extracted from an

rf excited plasma acting on a feed as introduced into a second chamber adjacent and contiguous with said coating chamber for a time period not exceeding sixty minutes; and

(f) progressively increasing the beam energy of said beam of ions from about 300 electron-volts to about 1200 electron-volts while said plurality of negatively biased parts are being exposed thereto.

4,526,674

OXYGEN GAUGE THE WORKING ELECTRODE OF WHICH IS COMPOSED OF A MACROCYCLIC PYROLIC COMPOUND

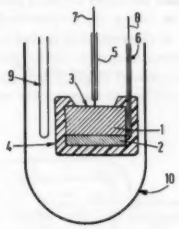
Mireille Fouletier; Elisabeth Siebert, both of Grenoble, and Jacques Le Moigne, Strasbourg, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Aug. 1, 1984, Ser. No. 636,546

Claims priority, application France, Aug. 3, 1983, 83 12799

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—426 **6 Claims**



1. Electrochemical device for measuring the oxygen concentration in a gaseous medium, comprising a working electrode sensitive to oxygen, a reference electrode constituted of a gas or a solid or a mixture of solids, and a solid ion conductor electrolyte, wherein the working electrode is constituted at least in part of a macrocyclic tetrapyrolic material.

4,526,675

HYDROCARBON CONVERSION METHOD

John A. Mahoney, Glen Ellyn, Ill.; Regis J. Pellet, Croton-on-Hudson, N.Y., and John J. Helstrom, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 26, 1983, Ser. No. 498,229

Int. Cl.³ C10G *1/08, 47/02*

U.S. Cl. 208—10 **19 Claims**

1. A method for recovering upgraded liquid products from a carbonaceous material selected from the group consisting of coal, coke, lignite, petroleum fractions, biomass, tar sands bitumen and shale oil, comprising: contacting the carbonaceous material with hydrogen under hydrogenation conditions comprising a temperature in the range of from about 300° C. to about 500° C. in the presence of a hydrocarbon conversion catalyst comprising a Group VIB metal component and a highly dispersed promoter comprising a tin component on support particles having a surface area of from about 140 to about 300 m^2/gm, a total pore volume by mercury penetration measurement of from about 0.4 cc/gm to about 1.0 cc/gm, a bimodal pore distribution with at least about 3% of its total pore volume in macropores having pore diameters greater than 600 A and at least about 60% of its total pore volume in micropores having pore diameters less than 600 A, with an average micropore diameter of from about 100 to about 200 A and an average macropore diameter in excess of 1,000 A, with the Group VIB metal component being in the form of the metal oxide or sulfide or a mixture thereof and at a concentration level of from about 3 to about 30 weight percent calculated as the metal oxide and based on the weight of the catalyst, and with the promoter component being in the form of a metal chloride, oxide, sulfide or a mixture thereof and at a total concentration level of from about 1 to about 50 weight percent, calculated as the metal chloride and based on the weight of the catalyst wherein the promoter either is in its molten state on the support particles at a temperature in the range of form about 300° C. to about 500° C. or was formed on the catalyst support from a molten precursor thereof on the catalyst support, and wherein, when the carbonaceous material is coal, coke, lignite or biomass, the carbonaceous material, hydrogen, and catalyst are contacted in a hydrogen-donor solvent.

4,526,676

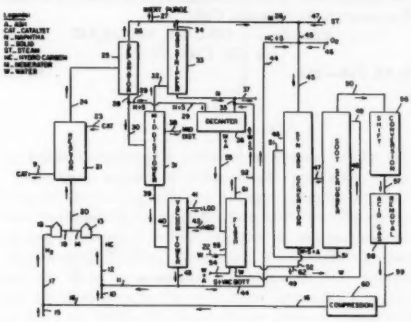
INTEGRATED H-OIL PROCESS INCLUDING RECOVERY AND TREATMENT OF VENT AND PURGE GAS STREAMS AND SOOT-NAPHTHA STREAM

Frederick B. Seufert, Bedford Hills, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Feb. 24, 1983, Ser. No. 469,182

Int. Cl.³ C10G *69/02*; C01B *3/36*

U.S. Cl. 208—58 **13 Claims**



1. The method which comprises

hydrotreating a heavy hydrocarbon charge having a 95% boiling point above about 975° F. in the presence of hydrotreating catalyst at 700° F.–850° F. and 2,000–3,500 psig hydrogen partial pressure thereby forming a product stream containing (i) hydrotreated hydrocarbon characterized by a boiling point lower than that of said heavy hydrocarbon charge, (ii) hydrogen, (iii) ammonia and hydrogen sulfide, and (iv) lower hydrocarbons;

separating from said product stream a separated gas stream containing hydrogen, ammonia, hydrogen sulfide and lower hydrocarbons;

passing at least a portion of said separated gas stream as temperature moderator to a synthesis gas generation reaction zone wherein a hydrocarbon charge stream is gasified in the presence of a free-oxygen-containing gas and in the presence of said temperature moderator thereby forming increased quantities of product synthesis gas; and

recovering said product synthesis gas.

5. The method which comprises

(i) hydrotreating a heavy hydrocarbon charge having a 95% boiling point above about 975° F. in the presence of hydrotreating catalyst at 700° F.–850° F. and 2,000–3,500 psig hydrogen partial pressure thereby forming a product stream containing hydrotreated hydrocarbon characterized by a boiling point lower than that of said heavy hydrocarbon charge and a separated gas stream including, hydrogen, ammonia and hydrogen sulfide, and lower hydrocarbons;

(ii) mixing said hydrotreated hydrocarbon characterized by a boiling point lower than that of said heavy hydrocarbon charge and a recycle stream containing naphtha and soot

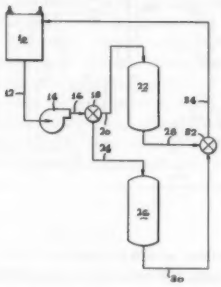
thereby forming a hydrotreated hydrocarbon stream containing naphtha and soot;
(iii) fractionating said hydrotreated hydrocarbon stream containing naphtha and soot thereby forming a bottoms slurry stream containing a heavy hydrocarbon fraction and soot;
(iv) passing at least a portion of said bottoms slurry stream containing a heavy hydrocarbon fraction and soot as charge to a synthesis gas generation reaction zone wherein at 2,000° F.–3,000° F. and 100–2,500 psig, gasification is effected to yield product synthesis gas;
(v) passing at least a portion of said separated gas stream as temperature moderator to the synthesis gas generation reaction zone thereby forming increased quantities of product synthesis gas;
(vi) recovering said product synthesis gas.

4,526,677

REMOVAL OF POLYHALOGENATED BIPHENYLS FROM ORGANIC LIQUIDS

LeRoy F. Grantham, Calabasas, and Joseph A. Ashworth, Northridge, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 4, 1984, Ser. No. 616,837
Int. Cl.[3] C10G *21/16*
U.S. Cl. 208—262 **14 Claims**



1. A process for the removal of polyhalogenated biphenyls from an organic liquid contained in electrical equipment which comprises:
removing from said electrical equipment a portion of an organic liquid contaminated with polyhalogenated biphenyls;
contacting said portion with a combustible carbon adsorbent to selectively adsorb polyhalogenated biphenyls from said portion;
separating a partially purified portion from the adsorbent having polyhalogenated biphenyls adsorbed thereon; and
returning said partially purified portion to said electrical equipment.

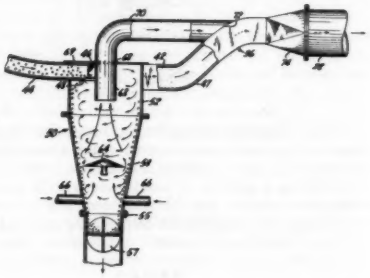
4,526,678

APPARATUS AND METHOD FOR SEPARATING LARGE FROM SMALL PARTICLES SUSPENDED IN A GAS STREAM

Jan Myhren, and Svein E. Gitlestad, both of Sewickley, Pa., assignors to Elkem Chemicals, Inc., Pittsburgh, Pa.

Filed Jun. 22, 1983, Ser. No. 506,634
Int. Cl.[3] B07B *3/00*
U.S. Cl. 209—2 **14 Claims**

1. Apparatus for separating small silica particles of less than 45 micron size from larger different types of foreign particles in the stack off-gas from a metallurgical furnace which comprises:
(a) a primary particle separator having first enclosed conduit means arranged in a substantially horizontal circular path which has an outer circular portion and an inner circular portion,
(b) a secondary particle separator having an enclosed hollow circular vessel with an outlet port at the top and at the bottom thereof and an inlet port in the top portion of said hollow circular vessel,
(c) said first enclosed conduit means having an inlet port and an outlet port,
(d) means for feeding said stack off-gas containing said large and small particles into said inlet port of said enclosed conduit means to flow in a stream in a first direction in said substantially horizontal circular path downstream toward said outlet port of said enclosed conduit means whereby the larger particles are concentrated in said stream of gas adjacent the interior wall of the outer circular portion of the circular path of said enclosed conduit means in said circular path,
(e) the interior area adjacent the outer circular portion of the circular path of said enclosed conduit means being decreased in the circular path in the downstream direction from said inlet port toward said outlet port and the interior area toward the inner circular portion of said enclosed conduit means being correspondingly increased in the circular path in downstream direction toward said outlet port to further concentrate the larger foreign particles in the smaller decreased interior area in the outer portion of the circular path and to suspend the small silica particles in



the increased interior area in the remaining portion of the circular path of the enclosed conduit means,
(f) means positioned and arranged downstream from the inlet port of said enclosed conduit means for separating stack gas from the outer circular portion of the circular path of said enclosed conduit means in which the larger particles are concentrated and for feeding the separated gas stream into the inlet port of the enclosed hollow circular vessel of said secondary particle separator and tangentially adjacent the inner circular wall of said vessel to flow downwardly in a second circular direction opposite to the first circular direction of flow in said first enclosed conduit means whereby the larger particles are concentrated adjacent the inner wall of said vessel,
(g) means for constricting the interior central area of said vessel below the inlet port thereof to further concentrate the downward flow of the larger particles in an annular layer adjacent the inner wall of said vessel,
(h) means for feeding a second stream of gas upwardly toward said outlet port of said vessel and through said larger particles in said constricted area of said vessel to air sift the larger particles and strip small silica particles from entrainment with the larger foreign particles and convey the small silica particles upwardly and out through the outlet port at the top of said vessel,
(i) means connecting the outlet port at the top of said vessel with the first enclosed conduit means to feed the stream of gas with small silica particles therein from the outlet port

of said vessel into the stream of gas containing small silica particles in said enclosed conduit at a location downstream from said means for separating stack gas from the outer portion of the circular path of said enclosed conduit means and upstream from the outlet port of said enclosed conduit means,

(j) means connected to the outlet port of said first enclosed conduit means for recovering the small particles of silica from the stream of gas leaving the outlet port of said first enclosed conduit means, and

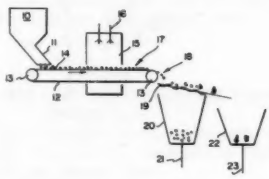
(k) closure means for discharging the larger particles from the outlet port at the bottom of said vessel.

4,526,679

REMOVAL OF LOW MELTING PARTICLES FROM UNGROUND COAL LIQUEFACTION RESIDUE

Ronald L. Litzinger, Long Beach, Calif., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 2, 1983, Ser. No. 528,829
Int. Cl.³ B03B *1/02*; B07B *1/00*
U.S. Cl. 209—3 **8 Claims**



1. The process for treating a feed mixture containing a minor proportion of low melting particles and a major proportion of high melting particles which comprises

heating said feed mixture to a temperature above the melting point of the low melting particles in said mixture and below the melting point of the high melting particles in said feed mixture;

contacting said low melting particles at temperatures above their melting point with at least one high melting particle at temperature below its melting point thereby forming an agglomerate of at least one low melting particle and at least one high melting particle within a bed of high melting particles;

separating said agglomerate from said bed of high melting particles; and

recovering said bed of high melting particles.

4,526,680

SILICONE GLYCOL COLLECTORS IN THE BENEFICIATION OF FINE COAL BY FROTH FLOTATION

Michael J. Owen, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 30, 1984, Ser. No. 615,395
Int. Cl.³ B03D *1/14*
U.S. Cl. 209—166 **16 Claims**

1. A froth flotation process for the beneficiation of fine coal, which process comprises the steps of forming an aqueous slurry of the fine coal, adding a collector and a frothing agent to the aqueous slurry of fine coal, subjecting the aqueous slurry of fine coal containing the collector and frothing agent to froth flotation, and separating the floated material which consists essentially of the beneficiated fine coal, wherein the collector is a water-dispersible polyorganosiloxane or a mixture of water-dispersible polyorganosiloxanes of general formula

$$R_aQ_bSiO_{(4-a-b)/2}$$

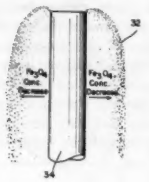
wherein the sum (a+b) has an average value of 0.9 to 2.7, a has an average value of zero to less than four, b has an average value of greater than zero to less than four, R is a monovalent alkyl radical containing from 1 to 20, inclusive, carbon atoms or a —OH radical, and Q is an organic radical attached to silicon through a Si—C bond and selected from the group consisting of polyethylene oxide radicals and polypropylene oxide radicals.

4,526,681

MAGNETIC SEPARATION METHOD UTILIZING A COLLOID OF MAGNETIC PARTICLES

Fritz J. Friedlaender, West Lafayette, Ind.; Makoto Takayasu, Somerville, Mass.; Jiann-Yang Hwang, Lafayette, Ind., and Leon Petrakis, Pittsburgh, Pa., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Oct. 31, 1983, Ser. No. 547,055
Int. Cl.³ B03C *1/00*
U.S. Cl. 209—214 **14 Claims**



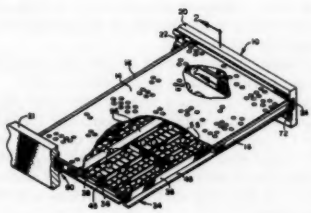
1. In a fluid comprising a colloidal suspension of first magnetic particles, a method of magnetically separating second particles, the second particles comprising a plurality of particle fractions having different magnetic susceptibilites, the method comprising the steps of introducing the second particles into the fluid, and establishing a magnetic susceptibility gradient through the fluid by establishing a magnetic field gradient through the fluid to cause the colloidally suspended first particles to form the magnetic susceptibility gradient through the fluid to cause the second particles to separate generally along the magnetic susceptibility gradient according to their respective magnetic susceptibilities.

4,526,682

SCREEN ASSEMBLY FOR SEPARATING PARTICULATE MATERIAL

William H. Wallace, Bluffton, Ind., assignor to Ferrell-Ross, Inc., Bluffton, Ind.

Filed Dec. 6, 1983, Ser. No. 558,505
Int. Cl.³ B07B *1/50*
U.S. Cl. 209—337 **18 Claims**



1. In an apparatus for separating particulate material of a selected size from particulate material of a smaller size, a screening assembly comprising:

(a) screen means having apertures of a selected size for receiving and separating the particulate material;

(b) impact elements for impacting the screen means to dislodge particulate material from the apertures;

(c) a support tray means adapted to underlie said screen means and having upwardly-projecting wall means to intermesh with the screen means to form an enclosure between said tray means and the screen means for said impact elements, said support tray means loosely supporting said impact elements in said enclosure;

(d) agitator means for agitating the enclosure to impact the screen means with the impact elements and to convey said particulate material along said screen means to separate the particulate material of the smaller size through the apertures;

(e) first guide means on the agitator means for receiving and supporting the screen means independently of the intermeshing support tray means; and

(f) second guide means on the agitator means for receiving and supporting the support tray means in said underlying relation to position said wall means in said intermeshing relationship with the screen means to form the enclosure, the second guide means being adapted to support the support tray means of the enclosure independently of the screen means of the enclosure so that the intermeshed screen means and support tray means are each independently supported, said first and second guide means adapted to permit sliding movement of said intermeshed screen means and tray means out of said intermeshing relationship so as to be freely separable.

4,526,683

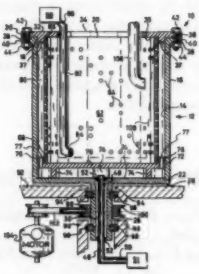
SOLIDS SEPARATOR

O. Neal Walker, 6111 Wade La., Knoxville, Tenn. 37166

Continuation of Ser. No. 360,165, Mar. 22, 1982, abandoned. This application Dec. 22, 1983, Ser. No. 565,015

Int. Cl.[3] B03B *5/00*

U.S. Cl. 209—423 **13 Claims**



1. A solids separator apparatus for sorting and collecting solids according to the density of individual particle fractions, said apparatus comprising:

a container provided with cylindrical walls having interior and exterior surfaces and a bottom wall;

a liner, having interior and exterior wall surfaces, carried concentrically within said container forming an annular jacket with said container about said liner, said liner being provided with apertures along the length thereof extending between said interior and exterior wall surfaces;

means for injecting said solid particles into the interior of said liner;

means for injecting liquid inwardly through said apertures in said liner from said jacket to create an artificial slurry with said particles within said liner;

means for rotating said container and said liner to generate a selected centrifugal force within said slurry to produce migration of particles to preselected radial locations within said liner according to their density and thereby accomplish the desired sorting; and

means for removing a selected fraction of particles of a desired density from said slurry at a radial location corresponding to that for said selected fraction.

4,526,684

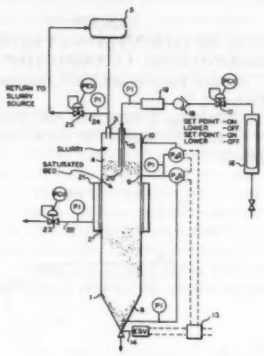
POLYMER SLURRY WASHING

Charles L. Seefluth, Bartlesville, Okla., assignor to Phillips Petroleum Company Bartlesville, Okla.

Division of Ser. No. 269,206, Jun. 2, 1981, Pat. No. 4,421,874. This application Sep. 13, 1983, Ser. No. 531,568

Int. Cl.[3] B01D *29/00*

U.S. Cl. 210—104 **8 Claims**



1. Apparatus for cross-extracting a polymer slurry comprising

(a) an essentially cylindrical housing confined by a wall,

(b) at least one filter portion in said wall,

(c) a filtrate receiver chamber associated with each filter portion,

(d) an inlet conduit with a wash fluid outlet, said wash fluid outlet being located inside of said housing so that wash fluid injected will flow under a substantial angle with respect to the longitudinal axis of said housing to said filter portion,

(e) a slurry removal conduit associated with the lower end of said housing, and

(f) a slurry inlet conduit connecting the upper portion of said housing with a source of a polymer slurry.

4,526,685

WASTE WATER TREATMENT PLANT

Gerald Rowland, Aston Clinton, England, assignor to Klargester Environmental Engineering Ltd., Buckinghamshire, England

Filed Apr. 11, 1984, Ser. No. 599,251

Claims priority, application United Kingdom, Dec. 22, 1983, 8334256

Int. Cl.[3] C02F *3/08*

U.S. Cl. 210—138 **10 Claims**

1. In a waste water treatment plant including

first tank means defining a bio zone,

means to feed waste water to said bio zone tank means to generate a liquid level therein,

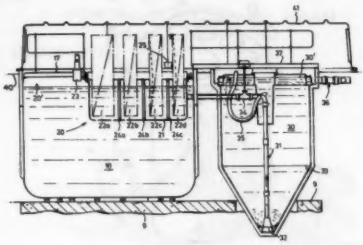
at least one rotor means rotatable about an axis and dipping only partially below the liquid level in the bio zone tank means,

drive means to turn said at least one rotor means about said axis to periodically convey an area of said rotor means through said waste water and then through the air above said liquid level,

second tank means defining a settlement zone,

means to feed liquid from said bio zone to said settlement zone, and duct means to feed purified liquid from the settlement zone away from the plant, and

desludging means in said second tank means to suck sludge collected in the second tank means back into the bio zone, the improvement which includes



arranging said means which feed liquid from said bio zone to said settlement zone to lift the liquid above the liquid level in the bio zone, whereby

said desludging means operates on the head of water existing between the bio zone and the settlement zone.

4,526,686

APPARATUS FOR CHROMATOGRAPHIC SAMPLE INJECTION

Giorgio Sisti, Milan, Italy; Sorin Trestianu, Brussels, Belgium, and Ermete Riva, Merate, Italy, assignors to Carlo Erba Strumentazione S.p.A., Rodano, Italy

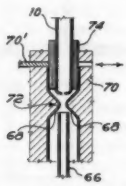
Continuation-in-part of Ser. No. 304,780, Sep. 23, 1981, Pat. No. 4,405,344. This application Sep. 20, 1983, Ser. No. 533,899

Claims priority, application Italy, Sep. 30, 1980, 25018 A/80; May 4, 1981, 21504 A/81

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.[3] **B01D** *15/08*

U.S. Cl. 210—198.2 **9 Claims**



1. An apparatus for volumetrically controlled and reproducible injection of small quantities of liquid sample into a chromatographic system, comprising, in combination with an injection device for a chromatographic system;

a sample container having a volume greater than a desired liquid sample volume and having a pipette- or nozzle-shaped neck at its outlet, terminating in an opening with a diameter of 1–100 μm;

positioning means for operatively positioning said sample container in a sample injection device of a chromatographic system, for injection of a sample through said outlet opening; and

pulse means communicating with said container for applying to a liquid inside the container at least one pressure pulse of controlled amplitude and duration, and ending in an abrupt pressure drop; wherein said pulse means comprises at least one transducer capable of producing at least one pressure pulse of high amplitude and short duration in the sample container; a pulse source for exciting said transducer; and means for adjusting at least one of the amplitude or the number of the pulses.

4,526,687

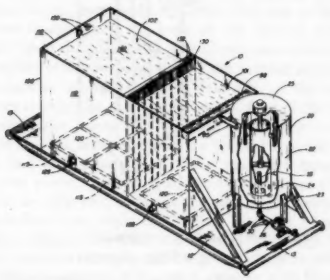
RESERVE PIT WASTE TREATMENT SYSTEM

James E. Nugent, Lafayette, La., assignor to Water & Industrial Waste Laboratories, Inc., Lafayette, La.

Continuation of Ser. No. 357,789, Mar. 12, 1982, abandoned, which is a continuation of Ser. No. 119,815, Feb. 8, 1980, abandoned. This application Oct. 24, 1983, Ser. No. 544,520

Int. Cl.[3] **C02F** *1/52;* **B01D** *21/08*

U.S. Cl. 210—202 **8 Claims**



1. A self-contained, transportable waste treatment apparatus comprising:

a. an elongated, transportable, structural sled;

b. a fluid inlet discharging into the bottom of at least one mixing tank at one end of the sled for supplying a waste stream containing a chemical enhancing the formation for floc thereto;

c. a hollow tube disposed vertically within the tank and surrounding the inlet, and means for circulating fluid through and around the tube so that the circulating fluid discharges from the top of the tube and then circulates around the tube in a direction which returns the fluid into the bottom of said tube to the area adjacent the inlet;

d. a plurality of vertically standing intersecting walls disposed about the periphery of the sled to define a settling tank on the sled;

e. outlet means at the end of the settling tank opposite the mixing tank for removing supernatent liquid from the settling tank so that flow proceeds through the tank in a general direction from the fluid inlet to the outlet means;

f. a plurality of vertically disposed baffle sections with small spaces therebetween forming a baffle structure extending from the top to the bottom of said settling tank that is placed interiorly of the settling tank transverse to the direction of flow, dividing the settling tank into primary and secondary sections, said spaces allowing the passage of water therethough to maintain a constant fluid level in said settling tank while enhancing floc size and solids deposition;

g. inlet wier means for transmitting supernatant liquid from the mixing tank to the primary section of the settling tank; and

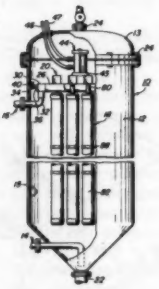
h. sludge drawoff means supported by the sled and disposed at the lower portion of the settling tank for removing settled sludge material from the primary and the secondary sections of the settling basin.

4,526,688

PRESSURE FILTER WITH VIBRATORY IMPACTOR

Henry Schmidt, Jr., Hinsdale; Allen E. Cederholm, Western Springs, and James F. Zievers, LaGrange, all of Ill., assignors to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Oct. 5, 1981, Ser. No. 308,283
Int. Cl.[3] B01D *35/20*
U.S. Cl. 210—323.2 13 Claims



1. A filter, comprising in combination,
a filter tank enclosing a filter chamber,
a liquid inlet opening into said tank through which a filtrate may be introduced into said chamber,
a rigid outlet manifold having a passageway therein,
an outlet from said tank connected to said passageway in said manifold,
shelf means affixed to said tank for supporting said outlet manifold in said chamber,
said manifold resting directly on said shelf means,
a plurlity of longitudinally incompressible filter elements suspended from said manifold in vertically oriented, mutually parallel positions,
said elements having internal cavities communicating with said passageway in said manifold, and
vibratory impactor means connected to said manifold for imparting vertically directed shock waves to said manifold,
whereby a shear force is exerted between said filter elements and filter cakes deposited thereon to release said cakes from said filter elements.

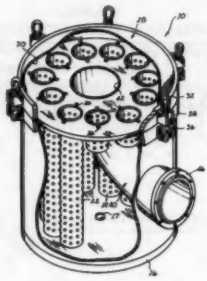
4,526,689

IN-LINE STRAINER

Howard W. Morgan, P.O. Box 735, Michigan City, Ind. 46360

Continuation of Ser. No. 510,276, Jul. 1, 1983, abandoned, which is a continuation of Ser. No. 362,872, Mar. 29, 1982, abandoned. This application Aug. 1, 1984, Ser. No. 636,084
Int. Cl.[3] B01D *29/10*
U.S. Cl. 210—323.2 4 Claims

1. In a strainer including a housing having side and bottom walls and a top wall, and top wall having means defining a first opening therein, said housing top wall having means defining a plurality of second openings radially spaced from said first opening, filtering means for straining a liquid removably suspended from each second opening, a cover spanning said housing top wall and having parts spaced from said first and second openings, means defining an outlet extending through said housing side wall and opening into the interior of said housing under said top wall, the improvement comprising means defining an inlet extending through said housing side wall and turning upwardly within said housing interior to said top wall first opening, whereby liquid passes from said inlet through said top wall first opening and over said housing top wall and



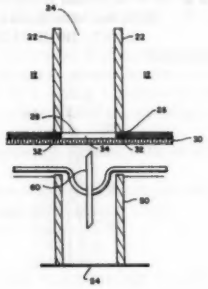
under said cover and through said filtering means into the interior of the housing and out said outlet.

4,526,690

APPARATUS FOR NUCLEIC ACID QUANTIFICATION

Joseph R. Kiovsky, Nashua, N.H., and Clifford L. Hendrick, Boxborough, Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Feb. 4, 1983, Ser. No. 463,747
Int. Cl.[3] B01D *31/00*
U.S. Cl. 210—335 10 Claims



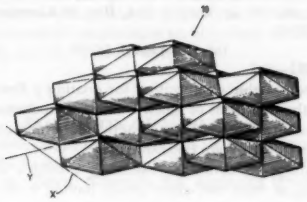
1. Apparatus comprising:
a plate having a thickness and at least one aperture extending through the thickness of the plate;
a first membrane selected from the group consisting of a microporous membrane and an ultrafiltration membrane and having an antibody coupled to said first membrane and disposed over one end of said at least one aperture in said plate such that at least one well having a discrete volume is formed;
a hydrophobic fabric contiguous to said first membrane at said one end;
a second plate defining at least one chamber, one of said at least one chamber being associated with one of said at least one aperture to receive all liquid passing through said at least one aperture, each said at least one chamber having a bottom comprising a second membrane selected from the group consisting of a microporous membrane and an ultrafiltration membrane and being capable of coupling to a single strand RNA or single strand DNA molecule.

4,526,691

SEPARATOR APPARATUS

William Melis, 218 Doddridge, Corpus Christi, Tex. 78411, and Richard D. Saam, 525 Louisiana Ave., Corpus Christi, Tex. 78404

Filed Dec. 10, 1982, Ser. No. 448,491
Int. Cl.[3] B01D *21/02*
U.S. Cl. 210—521 15 Claims



1. A three-dimensional lattice having a horizontal x dimension and y and z dimensions mountable in a separating tank for separating components from a carrier liquid, comprising:

a. a plurality of interconnected triangle pairs, each pair defining a cell therebetween;

b. each triangle pair comprising first and second triangles, the first and second triangles each being defined by a first side extending from the vertex to a first base angle, a second side extending from the vertex to a second base angle, a base and an inwardly directed face, the first and second triangles being positioned so that the first side of the first triangle and the base of the second triangle lie in the plane of a first lateral face of an imaginary triangular prism, the second side of the first triangle and the first side of the second triangle lie in a second lateral face of the imaginary triangular prism, and the base of the first triangle and the second side of the second triangle lie in a third lateral face of the imaginary triangular prism, the vertex of the first triangle touches the first base angle of the second triangle, the first base angle of the first triangle is located a distance X from the second base angle of the second triangle, and the second base angle of the first triangle is located a distance 2X from the vertex of the second triangle;

c. the triangle pairs being joined transversely in the x and y directions of the z-directioned longitudinal axis of the imaginary triangular prisms by joining

(1) the first side of the first triangle of a triangle pair to the first side of the first triangle of a first adjacent triangle pair;

(2) the base of the second triangle of the triangle pair to the base of the second triangle of the first adjacent triangle pair;

(3) the second side of the first triangle of the triangle pair to the second side of the first triangle of a second adjacent triangle pair;

(4) the first side of the second triangle of the triangle pair to the first side of the second triangle of the second adjacent triangle pair;

(5) the base of the first triangle of the triangle pair to the base of the first triangle of a third adjacent triangle pair; and

(6) the second side of the second triangle of the triangle pair to the second side of the second triangle of the third adjacent triangle pair; and

d. the triangle pairs being joined in the z direction along the longitudinal axis of the imaginary triangular prisms so that the second triangle of a lower triangle pair is the first triangle of an upper adjacent triangle pair.

8. A device for separating components from a carrier liquid, comprising:

a. a tank including an inlet chamber for the liquid to be treated, an outlet chamber for the treated carrier liquid, and at least one collection chamber for receiving components separated from the carrier liquid;

b. a three-dimensional lattice mounted in the tank and communicating with the inlet chamber, the outlet chamber and at least one collection chamber, the three-dimensional lattice comprising

(1) a plurality of interconnected isosceles triangle pairs, each pair defining a cell therebetween;

(2) each isosceles triangle pair comprising equal first and second isosceles triangles, the first and second isosceles triangles each being defined by a first side extending from the vertex to a first base angle, a second side extending from the vertex to a second base angle, a base, and an inwardly directed face, the first and second isosceles triangles being positioned so that the first side of the first isosceles triangle and the base of the second isosceles triangle lie in the plane of a first lateral face of an imaginary equilateral triangular prism, the second side of the first isosceles triangle and the first side of the second isosceles triangle lie in a second lateral face of the imaginary triangular prism, and the base of the first isosceles triangle and the second side of the second isosceles triangle lie in a third lateral face of the imaginary equilateral triangular prism, the vertex of the first isosceles triangle touches the first base angle of the second isosceles triangle, the first base angle of the first isosceles triangle is located a distance X from the second base angle of the second isosceles triangle, and the second base angle of the first isosceles triangle is located a distance 2X from the vertex of the second isosceles triangle, X being defined by the relationship

$$X = \frac{Y \tan \theta^{\circ}}{\sin\left(90 - \frac{\phi}{2}\right)^{\circ}}$$

where

Y=length of a line extending perpendicularly from the base to the vertex of the first or second isosceles triangle

ϕ=the vertex angle of the first or second isosceles triangle; and

θ=the angle defined by the base of the second isosceles triangle and the first side of the first isosceles triangle; and

(3) the isosceles triangle pairs being joined transversely in the x and y directions of the z-directioned longitudinal axis of the imaginary equilateral triangular prisms by joining

(a) the first side of the first isosceles triangle of an isosceles triangle pair to the first side of the first isosceles triangle of a first adjacent isosceles triangle pair;

(b) the base of the second isosceles triangle of the isosceles triangle pair to the base of the second isosceles triangle of first adjacent isoscles triangle pair;

(c) the second side of the first isosceles triangle of the isosceles triangle pair to the second side of the first isosceles triangle of a second adjacent isosceles triangle pair;

(d) the first side of the second isosceles triangle of the isosceles triangle pair to the first side of the second isosceles triangle of the second adjacent isosceles triangle pair;

(e) the base of the first isosceles triangle of the isosceles triangle pair to the base of the first isosceles triangle of a third adjacent isosceles triangle pair; and

(f) the second side of the second isosceles triangle of the isosceles triangle pair to the second side of the second isosceles triangle of the third adjacent isosceles triangle pair;

(4) the triangle pairs being joined in the z direction along the longitudinal axis of the imaginary equilateral triangular prisms so that the second isosceles triangle of a lower

isosceles triangle pair is the first isosceles triangle of an upper adjacent isosceles triangle pair; and

(5) the lattice being inclined an angle ω between the z axis and the vertical by rotating the lattice about the horizontal x axis, defined by $\theta° < \omega < 90°$.

4,526,692

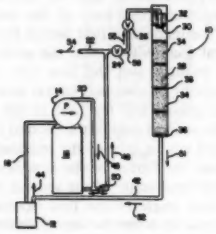
PROCESS FOR PURIFICATION OF CONTAMINATED GROUNDWATER

Thomas L. Yohe, 1406 Morstein Rd., and Karl M. Kyriss, 1554 Mill Race La., both of West Chester, Pa. 19380

Filed Jan. 13, 1984, Ser. No. 570,299

Int. Cl.³ C02F 1/74

U.S. Cl. 210—747 **11 Claims**



1. A process for obtaining delivery of purified water from a well where the groundwater feeding the well contains contaminants comprising the steps of:

pumping water from the well through the well head and through a flow path which passes through a water treatment unit and returns to the well through the well head;

removing, by means of said water treatment unit, at least a portion of the contaminants from the water in said flow path, as the water flows through said unit;

returning purified water from the water treatment unit to the well through the well head, whereby the well serves as a storage device for the returned water, and the returned water mixes with water in the well and serves as a buffer to encroachment by contaminated groundwater; and

delivering a portion of the water in the well to a point of use.

4,526,693

SHALE AND SALT STABILIZING DRILLING FLUID

Adelina J. Son; Vernon S. Neal, and Christopher M. Garvey, all of Houston, Tex., assignors to Halliburton Co., Duncan, Okla. and TXP Operating Co., Houston, Tex.

Filed May 16, 1983, Ser. No. 495,011

Int. Cl.³ C09K 7/02, 7/04

U.S. Cl. 252—8.5 B **7 Claims**

5. A method of preparing a clay-based drilling fluid comprising:

admixing from about 10 to about 70 ppb of ammonium chloride with an aqueous fluid until the ammonium chloride substantially is dissolved;

admixing from about 65 to about 150 ppb of sodium chloride with the aqueous ammonium chloride solution until a substantial portion of the sodium chloride is dissolved;

admixing from about 5 to about 30 ppb of a viscosifying agent comprising a clay with the aqueous ammonium chloride-sodium chloride solution whereby the occurrence of a substantial viscosity hump during said admixing is avoided; and,

adjusting the pH of the aqueous fluid to a level in the range of from about 5 to about 9 by the addition of a quantity of a pH-adjusting agent to form a clay-based drilling fluid capable of stabilizing shale and salt formations during drilling operations.

4,526,694

ACID-CONTAINING PRODUCT FOR THE TREATMENT OF MOIST WASH IN THE MECHANICAL CLOTHES DRIER

Rolf Puchta, Haan; Hans Nüsslein, Langenfeld; Alexander Boeck, Dusseldorf, and Benno Streschnak, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft (Henkel KGaA), Dusseldorf, Fed. Rep. of Germany

Division of Ser. No. 335,218, Dec. 28, 1981, abandoned. This application Dec. 14, 1983, Ser. No. 561,200

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1981, 3129549

Int. Cl.³ D06M 13/46

U.S. Cl. 252—8.8 **14 Claims**

1. An odor-stable composition for coating a flexible textile sheet for the treatment of moist wash in a mechanical clothes drier consisting essentially of an active softening composition selected from the group consisting of:

(1) mixtures of cationic quaternary nitrogen compounds having at least one alkyl group having 8 to 26 carbon atoms with small amounts of scenting agents,

(2) mixtures of said quaternary nitrogen compounds with small amounts of scenting agents, with up to an equal part by weight of nonionic surface-active compounds, and

(3) mixtures of either of components (1) and (2) above wherein part of said quaternary nitrogen compound has been replaced by the condensation products of the condensation of 1 mol of a higher fatty acid triglyceride with a mol of a hydroxy-lower alkyl-loweralkylenediamine or a hydroxy-lower alkylpolyloweralkylene polyamine, in a ratio by weight of from 4:1 to 1:4 of quaternary nitrogen compounds to condensation products,

wherein said composition contains from 0.2% to 3% by weight of at least one acid selected from the group consisting of hydroxy-lower alkane-carboxylic acid having from 1 to 2 hydroxyls and from 1 to 3 carboxyls, as well as none or from 0.05% to 1% by weight of at least one optical brightener, both based on the total weight of said active softening composition.

4,526,695

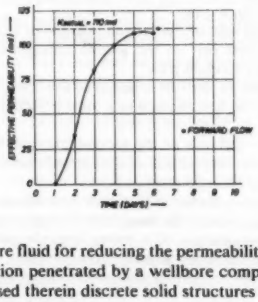
COMPOSITION FOR REDUCING THE PERMEABILITY OF SUBTERRANEAN FORMATIONS

Steven R. Erbstoesser, Missouri City; Claude E. Cooke, Jr., Houston, both of Tex.; Richard G. Sinclair, and Michael M. Epstein, both of Columbus, Ohio, assignors to Exxon Production Research Co., Houston, Tex.

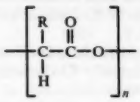
Division of Ser. No. 291,200, Aug. 10, 1981, Pat. No. 4,387,769. This application Feb. 4, 1983, Ser. No. 464,084

Int. Cl.³ E21B 33/138

U.S. Cl. 252—8.55 R **5 Claims**



1. A wellbore fluid for reducing the permeability of a subterranean formation penetrated by a wellbore comprising a fluid having dispersed therein discrete solid structures of a polymer having the repeating unit:



wherein R is H, C_1 to C_4 alkyl and n is sufficiently large to form a solid polymer, said polymer being substantially insoluble in said wellbore fluid and degradable in the presence of water at an elevated temperature to oligomers which are at least partially soluble in oil or water.

4,526,696

FLOTATION OF MINERALS

Raymond Delourme, Billere; Jean-Louis Detienne, Pau; Jacques Komornicki, Lescar, and Jacques Tellier, Lons, all of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Oct. 13, 1983, Ser. No. 541,560
Claims priority, application France, Oct. 13, 1982, 82 17127
Int. Cl.[3] C22B *3/00*; B03D *1/02*
U.S. Cl. 252—61 **12 Claims**

1. Collector composition for the flotation of minerals which when added to mineral pulp to be treated forms a microemulsion, comprising a mixture of a compound serving as the flotation collector selected from the group consisting of alkyl mercaptans of 8 to 18 carbon atoms and dialkyl polysulphides of the formula R—S_x—R′ in which each of the alkyl groups R and R′ have 1 to 14 carbon atoms and x is 2 to 8 with a liquid surfactant and an alcohol of at least 3 carbon atoms co-surfactant, the proportion of surfactant and alcohol being such that the mixture forms a microemulsion in water.

4,526,697

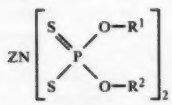
IMPROVEMENTS IN THE PREPARATION OF CONCENTRATES FOR HIGH WATER BASED HYDRAULIC FLUIDS

Paul V. Cox, Bracknell, United Kingdom, assignor to Castrol Limited, United Kingdom

Filed Aug. 24, 1983, Ser. No. 526,079
Claims priority, application United Kingdom, Aug. 25, 1982, 8224358
Int. Cl.[3] C10M *1/48, 3/42, 5/24, 1/06*
U.S. Cl. 252—75 **17 Claims**

1. A method of preparing a concentrate for a high water based hydraulic fluid, which method comprises the steps of:

(a) forming a first homogenous phase by dissolving in a coupling agent from 1 to 40% by weight of the final concentrate of a zincdihydrocarbyldithiophosphate (hereinafter referred to as ZDDP) of the general formula:

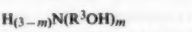


I

where R^1 and R^2 are each independently the same or a different hydrocarbyl group;

(b) forming a reaction product by reacting:

(i) from 0.3% to 20% by weight of the final concentrate of an alkanolamine of the general formula:



II

where m is 1, 2 or 3 and R^3 is an alkyl group, with

(ii) from 1 to 15% by weight of the final concentrate of a phosphate ester acid of the general formula:

III

where n is 1 or 2, x is between 1 and 20, and R^4 and R^5 are each independently a hydrocarbyl group, provided always that said alkanolamine is in excess of the amount required to react with all of said phosphate ester acid;

(c) forming a second homogenous phase by dissolving said reaction product in water and adding from 0 to 20% by weight of the final concentrate of a polyalkylene glycol having a molecular weight in the range 1,000 to 100,000; and

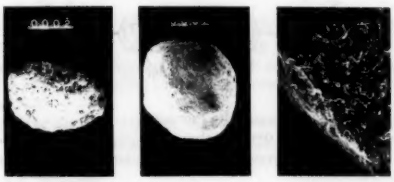
(d) mixing said first and second phases to produce a microemulsion.

4,526,698

BLEACHING DETERGENT COMPOSITION COMPRISES COATED SODIUM PERCARBONATE PARTICLES

Muthmi Kuroda, Funabashi; Moriyasu Murata, Chiba; Tsunesi Takeda, and Junich Tamura, both of Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jun. 7, 1983, Ser. No. 502,053
Claims priority, application Japan, Jun. 10, 1982, 57-99826
Int. Cl.[3] C11D *7/04, 3/395, 7/54*
U.S. Cl. 252—99 **21 Claims**



1. A bleaching detergent composition, which comprises: from 1 to 99% by weight of coated sodium percarbonate particles having an average particle diameter of from 100 to 2000 microns, each of said particles comprising a core consisting essentially of sodium percarbonate completely enclosed by a coating film of a coating agent containing from 10 to 100% by weight, based on said coating agent, of a borate selected from the group consisting of sodium tetraborate decahydrate, sodium tetraborate pentahydrate, sodium tetraborate tetrahydrate, anhydrous sodium tetraborate, sodium octaborate tetrahydrate, sodium pentaborate pentahydrate, sodium metaborate tetrahydrate and sodium metaborate dihydrate, said coated sodium percarbonate particles being blended with a detergent base.

4,526,699

ENCAPSULATED BLEACH COMPOSITION AND METHOD OF PREPARATION

Charles E. Jones, Yardley, and Mark A. Weiss, Fairless Hills, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 17, 1983, Ser. No. 542,797
Int. Cl.³ C11D 7/56
U.S. Cl. 252—99 20 Claims

1. A fabric bleach composition which minimizes localized attack on fabrics and dyes by available halogen comprising particles of a halogen bleaching agent having at least one N-halo atom capable of releasing a hypohalite ion to an aqueous solution, said particles coated with sufficient soluble, hydrated silicate-bound inorganic salt selected from the group consisting of sodium carbonate, trisodium phosphate, disodium phosphate, sodium sulfate, and condensed polyphosphates in admixture with a soluble alkali metal salt of boric acid, whereby ratio of the N-halo atoms to the boron atoms in the composition ranges from about 0.5:1 to about 10:1.

4,526,700

HYPOCHLORITE BLEACH COMPOSITIONS CONTAINING OPTICAL BRIGHTENERS

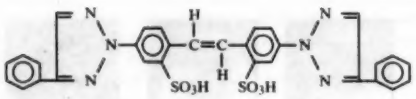
Charles A. Hensley, and David J. Kitko, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 549,333, Nov. 4, 1983, abandoned. This application Sep. 11, 1984, Ser. No. 649,457
Int. Cl.³ C11D 3/42, 3/28, 7/54
U.S. Cl. 252—102 15 Claims

1. An aqueous composition comprising:

(a) from about 3% to about 8% sodium hypochlorite;

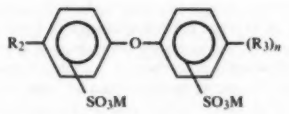
(b) from about 0.025% to about 0.2 % of an optical brightener having the formula:



or the alkali metal salts thereof;

(c) from about 0.05% to about 2% of a surfactant selected from the group consisting of alkylaryl sulfonates having the formulas:

and



wherein R_1 is a C_8-C_{20} alkyl group, R_2 and R_3 are C_6-C_{16} alkyl groups, M is alkali metal and n is 0 or 1; and

(d) at least about 80% water; wherein the brightener is present in the composition in the form of fibrous particles having fiber diameters of from about 0.01 to about 1.5 microns.

4,526,701

DYE STABILIZED DETERGENT COMPOSITIONS

Fred K. Rubin, Leonia, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 297,588
Int. Cl.³ C11D 9/00
U.S. Cl. 252—113 8 Claims

1. A color-stabilized aqueous detergent composition comprising in percent by weight of the composition:

(a) about 0.25% to about 95% surfactant;

(b) about 0.0001% to about 0.5% of dye selected from the group consisting of mono-azo, diamino derivatives of triphenyl methane, Color Index 59040 and mixtures thereof; and

(c) about 0.4% to about 1.2% of a polyhydroxy carboxylic acid or a salt thereof wherein said acid is selected from the group consisting of ascorbic acid; erythorbic acid; dihydroxy maleic acid and mixtures thereof, whereby color fading of said dye in said composition is substantially prevented.

4,526,702

PROCESS FOR MANUFACTURING BENTONITE-CONTAINING PARTICULATE FABRIC SOFTENING DETERGENT COMPOSITION

Richard S. Parr, E. Brunswick; Pallassana N. Ramachandran, Robinsville; Seymour Grey, Somerset, and Martin D. Reinish, Emerson, all of N.J., assignors to Colgate Palmolive Co., New York, N.Y.

Filed Aug. 25, 1982, Ser. No. 411,295
Int. Cl.³ C11D 17/06
U.S. Cl. 252—174.25 4 Claims

1. A process for manufacturing a fabric softening particulate synthetic organic detergent composition which comprises mixing together a minor proportion of a finely divided swelling bentonite powder of particle sizes, before agglomeration, such that substantially all of it passes through a No. 200 sieve, U.S. Sieve Series, and a major proportion of larger sized spray dried built synthetic organic detergent composition particles of sizes, before agglomeration, within the range of Nos. 8 to 100, U.S. Sieve Series, within the upstream third of the length of a rotary drum type mixer which extends longitudinally at an angle of from about 2° to 15° to the horizontal, spraying onto the surfaces of the mixture, while it is in motion, within about the middle third of the drum, from a plurality of spray nozzles onto the moving mixture, with new surfaces of the mixing materials being continuously presented to the spray, and with the spray droplets being of weight average diameter no greater than about one millimeter, a minor proportion of an aqueous sodium silicate solution at a concentration in the range of 2 to 8% of silicate, which is of Na_2O:SiO_2 ratio in the range of 1:1.6 to 1:3.2, in such quantity that the spray deposits from about 0.1 to 0.4% of sodium silicate and about 2 to 8% of moisture on the mixture, continuing mixing within about the downstream third of the drum after application of the aqueous sodium silicate solution, and removing as a product agglomerated particulate detergent with 10 to 30% of bentonite powder held to the surfaces thereof, which product is of a bulk density within the range of 0.3 to 0.7 g./ml.

4,526,703

ABSORBENT FOR THE DRY REMOVAL OF SULFUR DIOXIDE AND LIKE COMPONENTS OF AN EXHAUST GAS

Georg R. U. Gebhard, Reichshof; Klaus R. G. Hein, Bergheim-Ahe, and Wolfgang Glaser, Frechen, all of Fed. Rep. of Germany, assignors to Rheinisch-Westfallisches Elektrizitatswerk Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Aug. 26, 1983, Ser. No. 526,907

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232081

Int. Cl.³ C09K *3/00*; C01B *17/00*

U.S. Cl. 252—189 2 Claims

1. An absorbent for the dry removal of sulfur dioxide and other noxious and toxic components from a combustion flue gas which can be supplied to a combustion chamber in which a fossil fuel is burned to form said flue gas and which consists essentially of finely divided calcium hydroxide which is combined with 0.1 to 10 mole percent of acetic acid.

4,526,704

MULTIRING LIQUID CRYSTAL ESTERS

Martin Petrzilka, Kaiseraugst; Martin Schadt, Seltisberg, and Alois Villiger, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

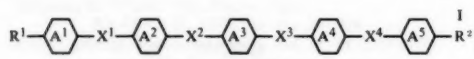
Filed Jul. 11, 1983, Ser. No. 512,846

Claims priority, application Switzerland, Jul. 28, 1982, 4581/82; May 5, 1983, 2443/83

Int. Cl.³ C09K *3/34*; G02F *1/13*; C07C *69/773, 69/78*

U.S. Cl. 252—299.61 16 Claims

1. A compound of the formula:



I

wherein one of X^1 and X^2 is —COO— or —OOC— and the other is a single covalent bond or $—CH_2CH_2—$; X^3 and X^4 individually are a single covalent bond or $—CH_2CH_2—$; with the proviso that at most one of X^1, X^2, X^3 and X^4 is $—CH_2CH_2—$; rings A^1 and A^5 individually are 1,4-phenylene or trans-1,4-cyclohexylene; rings A^2, A^3 and A^4 individually are 1,4-phenylene or, when ring A^2, A^3 or A^4 is not linked with at least one of the other two of these rings by a single covalent bond then such ring also can be trans-1,4-cyclohexylene, with the proviso that at least one of rings A^1 through A^5 is 1,4-phenylene; and R^1 and R^2 individually are straight-chain alkyl of 1–7 carbon atoms, or when R^1 or R^2 is attached to 1,4-phenylene such R^1 or R^2 also can be straight-chain alkoxy of 1 to 7 carbon atoms.

4,526,705

LIGHT-COLLECTING SYSTEMS AND THE USE OF COUMARIN DERIVATIVES AS ENERGY CONVERTERS IN THEM

Frank Arndt, Krefeld; Uwe Claussen, Leverkusen; Horst Harnisch, Much, and Carl-Wolfgang Schellhammer, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

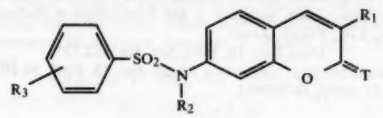
Continuation of Ser. No. 223,882, Jan. 9, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,587

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1980, 3001877

Int. Cl.³ C09K *11/02, 11/06*

U.S. Cl. 252—301.32 18 Claims

1. In a light-collecting system comprising an emission surface and an absorption surface wherein the ratio of the emission surface to the absorption surface is 1:50–2,000, said light-collecting system comprising a medium which has a greater optical density than its surrounding and which has at least one center capable of fluorescence wherein said center contains an energy converter, the improvement wherein said energy converter comprises a coumarin derivative of the formula



in which

T designates 0,

wherein

R_1 designates a pyrazolyl-, imidazolyl-, thiazolyl-, 1,2,4-triazolyl-, 1,3,4-thiadiazolyl-, benzimidazolyl-, benzthiazolyl-, pyridinyl-radical or a radical derived from benzpyrimidone, the heterocyclic radicals mentioned being unsubstituted or substituted;

R_2 designates hydrogen, and unsubstituted or substituted alkyl, cycloalkyl, aralkyl or aryl, and

R_3 designates hydrogen, alkyl, cycloalkyl, aralkyl, aryl or a $—OR_5$, $—SO_2R_5$, $—SO_2NHR_5$, $—NHCOR_5$, halogen or $COOR_5$ radical,

wherein

R_5 represents alkyl, cycloalkyl, aralkyl or aryl, and wherein said medium comprises a plastic which transmits light and can be used for optical purposes.

4,526,706

CONDUCTIVE LATEX COMPOSITIONS, ELEMENTS AND PROCESSES

Donald A. Upson, Webster, and David J. Steklenski, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 145,395, May 1, 1980, Pat. No. 4,308,332. This application Jul. 30, 1981, Ser. No. 288,587

Int. Cl.³ H01B *1/00*

U.S. Cl. 252—500 17 Claims

1. A coating composition comprising a latex having water as a continuous phase and, as a dispersed phase, cationically stabilized, hydrophobic polymer particles having associated therewith a polyaniline acid addition salt semiconductor.

9. A process for preparing a coating composition comprising a latex having water as a continuous phase and, as a dispersed phase, cationically stabilized, hydrophobic polymer particles having associated therewith a polyaniline acid addition salt semiconductor, said process comprising the steps of:

(a) forming a solution by dissolving a polyaniline in a water-miscible organic solvent;

(b) forming a latex by dispersing cationically stabilized, hydrophobic loadable polymer particles in an aqueous continuous phase;

(c) blending said latex with said solution;

(d) loading said polymer particles by removing said organic solvent thereby forming a polyaniline-loaded latex; and

(e) forming a polyaniline salt-loaded latex by adding sufficient acid to said polyaniline-loaded latex to convert substantially all of said polyaniline-loaded latex to polyaniline salt-loaded latex.

4,526,707

SEMICONDUCTING COMPOSITIONS AND WIRES AND CABLES USING THE SAME

Yoshikazu Kutsuwa; Kouji Kitahara, and Toshiyuki Ishii, all of Ichihara, Japan, assignors to Du Pont-Mitsui Polychemicals Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 562,727

Claims priority, application Japan, Jun. 13, 1983, 58-105588; Oct. 17, 1983, 58-193892

Int. Cl.[3] H01B *1/06*

U.S. Cl. 252—511 21 Claims

1. A semiconducting composition comprising

(A) a random copolymer of propylene and an alpha-olefin having 4 to 8 carbon atoms or of propylene, an alpha-olefin having 5 to 8 carbon atoms, and, ethylene, said copolymer containing 50 to 87 mole %, based on the entire recurring units, of the propylene units, and

(B) fine particles of carbon black in an amount sufficient for the composition to have a volume inherent resistivity of 10^0 to 10^6 ohms-cm at 23° C., said fine particles of carbon black having a specific surface area of about 40 to about 1200 m^2/g.

20. A semiconducting composition according to claim 1 having a volume inherent resistivity of 10^0 to 10^6 ohms-cm and comprising

(A) a random copolymer of propylene and an alpha-olefin having 4 to 8 carbon atoms or of propylene, an alpha-olefin having 4 to 8 carbon atoms, and, ethylene, the copolymer containing 50 to 87 mole % of propylene units based on the entire recurring units and having a melt flow rate at 190° C. of about 10 to about 50 dg/min.,

(B) acetylene black and furnace black, and

(C) a random copolymer containing ethylene and an unsaturated caboxylic acid ester having 4 to 8 carbon atoms, said copolymer containing at least 3 mole % of the unsaturated carboxylic acid ester units based on the entire recurring units and having a melt flow rate at 190° C. of about 1 to about 30 dg/min.; and

(D) the proportion of the random copolymer (C) being 150 to 400 parts by weight per 100 parts by weight of the random copolymer (A) and the proportion of acetylene black and furnace black (B) being 30 to 50 parts by weight and 20 to 40 parts by weight, respectively, per 100 parts by weight of the random copolymer (A) and the random copolymer (C) combined.

4,526,708

IRREVERSIBLE DONOR DOPING OF CONJUGATED BACKBONE POLYMERS

Ronald L. Elsenbaumer; Granville G. Miller, both of Morristown, and James E. Toth, Maplewood, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 30, 1983, Ser. No. 556,718

Int. Cl.[3] H01B *1/06*

U.S. Cl. 252—518 7 Claims

1. A method of introducing electrons along with alkali metal cations into polyacetylene which comprises contacting said polyacetylene with a compound of the formula MR wherein M is an alkali metal and R is selected from the group consisting of alkyls of 1–12 carbons, phenyl and alkylphenyls of 7–12 carbons, under conditions forming negatively charged polyacetylene intercalated by M^+ cations in an amount sufficient to produce a conductivity in said polyacetylene of at least about 10^{-5} s/cm and an organic by-product not susceptible to reaction with the negatively charged polyacetylene to reform the compound MR.

4,526,709

BUILT LIQUID DETERGENT COMPOSITIONS CONTAINING ZEOLITE Y

Jelles V. Boskamp, and Willem M. M. Möhlmann, both of Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 19, 1984, Ser. No. 651,728

Claims priority, application United Kingdom, Oct. 12, 1983, 8327271

Int. Cl.[3] C11D *3/06, 3/12, 3/33, 17/08*

U.S. Cl. 252—527 3 Claims

1. An aqueous, built liquid detergent composition comprising, in an aqueous medium,

(a) from 1–60% by weight of an active detergent material;

(b) from 5–30% by weight of a builder salt selected from the group consisting of alkalimetal condensed phosphates, alkalimetal nitrilotriacetates and mixtures thereof, and

(c) from 1–45% by weight of a zeolite, wherein the zeolite is a zeolite of the Y-type having the following unit cell composition:

$$Na_{56}[AlO_2)_{56}(SiO_2)_{136}].250\ H_2O,$$

the compositions having a pH of 7–9 and exhibiting stability against phase separation and against decomposition of the zeolite component.

4,526,710

LIQUID DETERGENT COMPOSITION

Noriyoshi Fujisawa, Sakura; Katsuaki Ooshima, Tokyo; Junko Iijima, and Katsuhiko Deguchi, both of Matsudo, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Dec. 1, 1982, Ser. No. 446,036

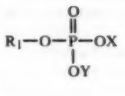
Claims priority, application Japan, Dec. 14, 1981, 56-201354

Int. Cl.[3] C11D *1/34, 1/75*

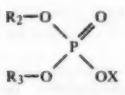
U.S. Cl. 252—545 1 Claim

1. A liquid detergent composition comprising the following three ingredients:

(a) an alkanolamine salt of phosphoric ester represented by the general formula (I) or (II)



(I)



(II)

in which R_1, R_2, and R_3 independently represent a hydrocarbon group having 8–18 carbon atoms, X represents an alkanolamine which has a hydroxyalkyl group having 2 or 3 carbon atoms, and Y represents an hydrogen atom or has the same meaning as X;

(b) an alkanolamine salt of a higher fatty acid, the alkanolamine having an alkyl group whose carbon atoms are 2 or 3 in number; and

(c) an alkylamine oxide which has a hydrocarbon group having 10–14 carbon atoms,

wherein ingredient (a) is in the range of 10–60% by weight, ingredient (b) is in the range of 0.5–10% by weight and ingredient (c) is in the range of 1–8% by weight.

4,526,711
HIGH REFRACTIVE INDEX FLUID AND MELT MOUNTING MEDIA

Robert L. Sacher, and William J. Sacher, both of Newton, N.J., assignors to R. P. Cargille Laboratories, Inc., Cedar Grove, N.J.

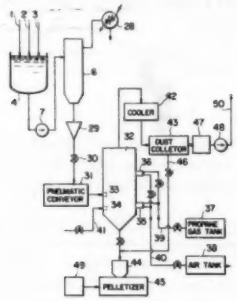
Filed Sep. 9, 1983, Ser. No. 530,537
Int. Cl.[3] G02B *21/34;* G01N *21/15*
U.S. Cl. 252—582 **7 Claims**

7. A liquid optical coupling material for bonding one optical part to another, said material consisting essentially of a blend by volume of 45% pentabromodiphenyl oxide, 22% of octabromodiphenyl oxide, and 32% of an alpha-methylstryrene polymer and polymer selected to have an index of refraction of between 1.557 to 1.586 at 5893 Angstroms and having a density of between 0.98 to 1.03 g/cc at 25°, and of a 1% stabilizer being 2-hydroxy-4-iso-octoxybenzophenone to give a refractive index at 25° C. of 1.662 at 5893 Angstroms, with a pour point between 60° to 70° C.

4,526,712
PROCESS FOR TREATING RADIOACTIVE WASTE

Mikio Hirano, and Susumu Horiuchi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 107,918
Claims priority, application Japan, Jan. 12, 1979, 54-2758
Int. Cl.[3] G21F *9/14*
U.S. Cl. 252—632 **6 Claims**



1. A process for treating radioactive sludge waste comprising the steps of:

pulverizing radioactive sludge waste which is wet, insoluble and combustible, while heating the radioactive sludge waste to make a dry powder suitable for combustion, said step of pulverizing the radioactive sludge waste including the steps of making thin films of the radioactive sludge waste during grinding of the waste into powder, and heating the thin films and the powder to vaporize the water contained in the powder;

burning the dry powder by dispersing the powder over flames to form ashes and to reduce the volume of the radioactive waste while exhausting combustion gas from the zone of combustion;

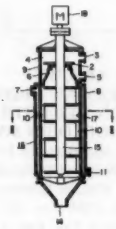
collecting the ashes; and

pelletizing the ashes to form pellets having a volume substantially less than the volume of the ashes.

4,526,713
PROCESS AND SYSTEM FOR TREATMENT OF RADIOACTIVE WASTE

Koichi Chino, Hitachi; Kazuhiko Kudo, Ibaraki; Akira Oda, Hitachi; Hideichi Mura, Tokai, and Yoshiyuki Takamura, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 12, 1981, Ser. No. 224,110
Claims priority, application Japan, Jan. 10, 1980, 55-1873
Int. Cl.[3] G21F *9/08*
U.S. Cl. 252—632 **12 Claims**



1. A process for treatment of waste liquid material including dissolved radioactive substances, comprising:

heating the waste liquid material to vaporize the liquid and to deposit said radioactive substances on a heat transfer surface;

wiping the radioactive substances deposited on the heat transfer surface to form a dry powder by rotary wiping blades;

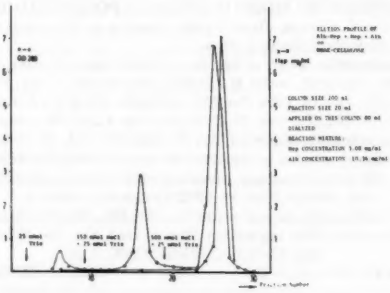
measuring the flow rate (W) of the entering waste liquid material and the concentration (C) of the radioactive substances to be powdered in the waste liquid material, thus determining the quantity of the radioactive substances to be powdered by the product of (W×C); and

controlling the rotational speed of the wiping blade in accordance with the quantity of the radioactive substances to be powdered.

4,526,714
CONJUGATES OF ANTICOAGULANT AND PROTEIN

Jan Feijen, Hengelo, and Wilhelmus E. Hennink, Enschede, both of Netherlands, assignors to Cordis Europa N.V., Roden, Netherlands

Filed Dec. 13, 1982, Ser. No. 449,248
Int. Cl.[3] C08B *37/10*
U.S. Cl. 260—112 R **16 Claims**



1. A process for the improvement of compatibility between blood and a substrate, the process including coating the substrate with an anticoagulant material, wherein the process

comprises adsorbing a protein-anticoagulant conjugate to said substrate, said substrate being a hydrophobic material or a hydrophilic material, said protein of the protein-anticoagulant conjugate being a water soluble protein that is non-crosslinked when adsorbed onto said substrate, and said protein-anticoagulant conjugate is prepared according to a process that includes coupling said anticoagulant to said water soluble, non-crosslinked protein within an aqueous medium and in the presence of a coupling agent and providing an anticoagulant-protein conjugate by using a coupling agent that is an amide bond forming agent to form an amide linkage between said anticoagulant and said protein.

4,526,715

METHOD OF PREPARING HIGHLY PURIFIED, STROMA-FREE, NON-HEPATITIC HUMAN AND ANIMAL HEMOGLOBIN SOLUTIONS

Norbert Kothe, Kronberg, and Bertram Eichentopf, Bad Soden, both of Fed. Rep. of Germany, assignors to Biotest Pharma GmbH, Frankfurt, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 614,595

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412144

Int. Cl.[3] **A61K** *35/18, 37/02;* **C07G** *7/00;* **C07C** *103/52*

U.S. Cl. 260—112 B **6 Claims**

1. A method of preparing a highly purified, stroma-free, non-hepatitic human or animal hemoglobin solution, comprising

(a) pumping a starting material that contains erythrocytes to overflow a filter unit that has a pore size between 0.1 and 1.2 μm in circulation against an isotonic washing solution, continuously drawing off used washing solution and replenishing it with fresh washing solution,

(b) harvesting the washed and concentrated erythrocytes from the filter, hemolyzing the erythrocytes, pumping the hemolysate at almost constant volume to overflow an ultrafiltration unit that has a permeability of 80,000 to 100,000 D in circulation against water, and

(c) pumping the dilute hemoglobin solution obtained in step (b) as an ultrafiltrate at almost constant volume to overflow an ultrafiltration unit that has a permeability of 10,000 to 50,000 D in circulation against water thereby to effect diafiltration, and continuing pumping in circulation before and/or after diafiltration through the same ultrafiltration unit but without a countercurrent of water until the hemoglobin is concentrated to a predetermined level.

4,526,716

ANTIGENIC MODIFICATION OF POLYPEPTIDES

Vernon C. Stevens, Dublin, Ohio, assignor to The Ohio State University, Columbus, Ohio

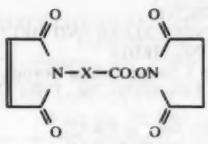
Continuation-in-part of Ser. No. 323,690, Nov. 20, 1981, Pat. No. 4,384,995, which is a continuation-in-part of Ser. No. 112,628, Jan. 16, 1980, Pat. No. 4,302,386, which is a division of Ser. No. 936,876, Aug. 25, 1978, Pat. No. 4,201,770, which is a continuation-in-part of Ser. No. 622,031, Oct. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 462,955, Apr. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 406,821, Oct. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 357,892, May 7, 1973, abandoned. This application Mar. 4, 1983, Ser. No. 472,190

Int. Cl.[3] **C07C** *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **18 Claims**

1. A process for preparing an isoimmunogen for controlling biological action in an animal which comprises:

activating under neutral or acid conditions a carrier not having a sulfhydryl group but having an amino group with an activator of the structure:



where X represents a non-reacting group comprising substituted or unsubstituted phenyl or C_{1-10} alkylene moieties, or a combination thereof, or an amino acid chain, so as to cause reaction of the activator with such amino group, said carrier being biologically foreign to said animal and selected having a size sufficient to elicit antibody response following the administration thereof into the body of said animal; and

treating the resulting activated carrier with a hormone endogenous to said animal, non-hormonal polypeptide endogenous to said animal, non-hormonal polypeptide or a synthetic or natural fragment of either having a sulfhydryl group.

4,526,717

POLYPEPTIDE HAVING AN ACTION ON THE IMMUNOLOGICAL SYSTEM, PROCESSES FOR ITS ISOLATION AND PURIFICATION, ITS USE, AGENTS CONTAINING THIS COMPOUND, AND ITS CLEAVAGE PRODUCTS, THEIR USE AND AGENTS CONTAINING THESE PRODUCTS

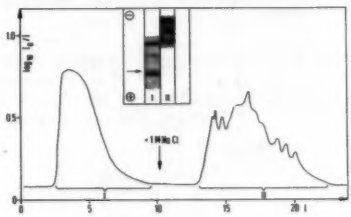
Gerhard Seipke, Wiesbaden, Dominique Tripier, Eppstein, and Gerd Johnscher, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

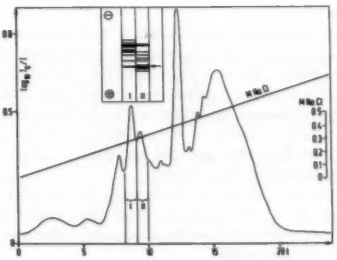
Division of Ser. No. 522,204, Aug. 11, 1983, Pat. No. 4,500,450. This application Jul. 3, 1984, Ser. No. 627,647

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1982, 3230151

Int. Cl.[3] **C07C** *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **3 Claims**





1. A peptide cleavage product of a polypeptide having an action on the immunological system or of the pharmacologi-

cally acceptable salts of said polypeptide, said polypeptide having a molecular weight of 3,480, a UV absorption with a maximum at 205 to 210 nm, an isoelectric point at 3.95±0.15 and the following aminoacid composition: 4 asparaginic acid units, 3 threonine units, 3 serine units, 6 glutamic acid units, 1 glycine unit, 4 alanine units, 3 valine units, 1 isoleucine unit, 1 leucine unit, 5 lysine units and 1 arginine unit, and N-terminal, if appropriate, carrying an acyl group having 1 to 6 carbon atoms or an acylglycyl group, the acyl group of which has 1 to 6 carbon atoms, and said peptide cleavage products comprising 4 or more amino acids.

4,526,718

3,3-DI(ACYLTHIO)-2(4-ALLYLTHIOAZETIDIN-2-ON-1-YL)PROPENOIC ACID ESTER COMPOUNDS

Barry C. Ross, Luton; Graham Johnson, Milton Keynes, both of England, and Michael A. Yeomans, Liederbach, Fed. Rep. of Germany, assignors to Hoechst UK Limited, Great Britain

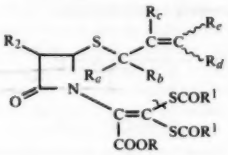
Continuation of Ser. No. 318,113, Nov. 4, 1981, Pat. No. 4,474,793. This application Aug. 22, 1983, Ser. No. 524,977

Claims priority, application United Kingdom, Nov. 6, 1980, 8035657

Int. Cl.³ C07D *205/08, 513/04, 499/00*

U.S. Cl. 260—239 A **1 Claim**

1. A compound of the formula



wherein

R is a carboxyl esterifying group removable by hydrolysis, photolysis, reduction, or enzyme action without substantial degradation of the rest of the molecule to give the free acid;

R^1 is lower alkyl or phenyl;

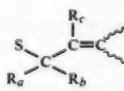
R^2 is hydrogen, lower alkyl, lower alkoxyalkyl, lower alkanoyloxyalkyl, or tri-lower alkylsilyloxyalkyl;

R_a, R_b, R_c, R_d, and R_e, taken alone, are the same or different and are hydrogen, alkyl or alkenyl having up to 8 carbon atoms, cycloalkyl or cycloalkenyl having up to 18 carbon atoms, halogen, cyano, carboxyl, or carboxyl esterified with an unsubstituted aliphatic alcohol having up to 20 carbon atoms;

any two of R_a, R_b, R_c, R_d, and R_e, taken together with the carbon atom or atoms to which they are attached, may form a cycloaliphatic ring having 3 to 10 carbon atoms, said compound having none, one, or two of such rings present therein;

R_c is cis or trans with respect to R_d; and

R^2 is cis or trans with respect to



4,526,719

BENZOQUINONE DERIVATIVES AND PRODUCTION THEREOF

Shinji Terao, Toyonaka; Hisayoshi Okazaki, Kyoto, and Isuke Imada, Izumi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

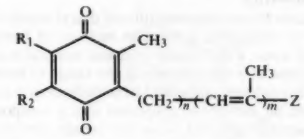
Filed Apr. 12, 1983, Ser. No. 484,232

Claims priority, application Japan, Apr. 13, 1982, 57-62224

Int. Cl.³ C07C *66/00*

U.S. Cl. 260—346 R **6 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are the same or different and each is methyl or methoxy; n is an integer of 0 to 21; m is 0 or 1 and Z is a group of the formula

wherein R_6 is a divalent hydrocarbon group of 1 to 3 carbon atoms.

4,526,720

PROCESS TO PREPARE STABILIZED MONOLITHIUM ACETYLIDE

Verlan H. Van Rheenen, Portage, and Dae Y. Cha, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 5, 1984, Ser. No. 568,558

Int. Cl.³ C07J *1/00*

U.S. Cl. 260—397.4 **17 Claims**

1. A process to prepare monolithium acetylide which comprises

(1) dissolving acetylene in a dry solvent

(2) contacting a stabilizing mono-amine with an organolithium compound from about 0° to about −40°

(3) contacting the product of step (2) with the solution of step (1) from about 0° to about −40°.

11. A process to prepare monolithium acetylide and a 17α-ethynyl-17β-hydroxy steroid which comprises

(1) dissolving acetylene in a dry solvent,

(2) contacting a 17-keto steroid with the mixture of step (1),

(3) contacting a stabilizing mono-amine with an organolithium compound at about 0° or less, and

(4) contacting the mixture of step (3) with the mixture of step (2) from about 0° to about −40°.

4,526,721

CURING OF EPOXIDE RESINS

Frank B. Richardson, Consett, England, assignor to Thomas Swan & Co. Ltd., Great Britain

Filed Jun. 27, 1983, Ser. No. 508,528

Claims priority, application United Kingdom, Jun. 28, 1982, 8218625

Int. Cl.³ C08G *59/54*

U.S. Cl. 260—404.5 **12 Claims**

1. A method of producing a curing agent for an epoxide resin which comprises the steps of:

forming an aqueous solution by dissolving in water an amidoamine or an imidazoline formed by reacting together an acid component and an amine component; and

carbonating the amidoamine or amidazoline by contacting the solution with carbon dioxide to obtain the desired curing agent.

4,526,722

MANUFACTURE OF DIACYLOXY AROMATIC COMPOUNDS

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 18, 1983, Ser. No. 486,150
Int. Cl.³ C11C *3/02*; C07C *67/00*
U.S. Cl. 260—410.5 **6 Claims**

1. A process for the manufacture of diaryl esters consisting essentially of contacting a reaction mixture of benzene or a monophenyl ester, a carboxylic acid and molecular oxygen in the liquid phase at a temperature in the range of from 100° to 300° C. with a catalyst composed of palladium or a compound of palladium, an antimony compound and a compound of at least one member selected from the group consisting of an alkali metal and tin wherein the molar ratio of Pd:Sb:other metals is in the range of 1:50:20 to 1:0.1:0.1.

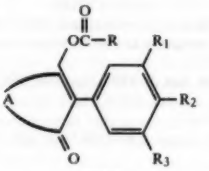
4,526,723

BIOCIDAL ENOL ESTERS OF NON-ORTHO SUBSTITUTED 2-ARYL-1-3-CYCLOALKANEDIONE COMPOUNDS

Thomas N. Wheeler, and Mathias H. J. Weiden, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 946,311, Sep. 27, 1978, abandoned. This application Jul. 5, 1983, Ser. No. 510,731
Int. Cl.³ C11C *3/04*; C07C *69/03*
U.S. Cl. 260—410.5 **12 Claims**

1. A compound of the formula:



wherein:

R is an alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, haloalkyl, phenyl or phenylalkyl group, all of which may be substituted with one or more alkyl, cyano, nitro, alkoxy, halogen, alkylthio, alkoxyalkyl, or alkylthioalkyl groups, provided that R may not include more than thirty aliphatic carbon atoms;

R_1, R_2, and R_3 may not individually include more than ten aliphatic carbon atoms and are individually hydrogen, haloalkyl, polyhaloalkyl, halogen or alkyl groups;

A is an alkylene or alkenylene chain containing two or three carbon atoms which chain may be substituted by one or more substituents which may be the same or different selected from:

(a) substituents which may not include more than ten aliphatic carbon atoms selected from: an alkyl, alkenyl, cycloalkyl or cycloalkenyl group, which groups may be further substituted by one or more cyano, halogen, nitro, alkoxy, aryloxy, alkylthio, arylthio, alkylsulfinyl, arylsulfinyl, alkylsulfonyl, arylsulfonyl, acylamido, or dialkylamino substituents in any combination; and a phenyl group which may be substituted by one or more alkyl, alkenyl, cycloalkyl, cycloalkenyl, cyano, halogen, nitro, alkoxy, aryloxy, alkylthio, arylthio, alkylsulfinyl, arylsulfinyl, alkylsulfonyl, arylsulfonyl, acylamido or dialkylamino substituents in any combination;

(b) a divalent alkylene or alkenylene group having from 2 to 20 carbon atoms completing a 3,4,5,6 or 7 membered carbon ring with the proviso that when A is a hydrocarbon chain containing two carbon atoms, a six membered fused polycyclic ring structure completed by a divalent butylene group may not have conjugated double bonds in said six membered ring, with the proviso that when A is a divalent alkylene group having 3 carbon atoms completing a 6 membered carbon ring subtituted at the 5 position on said ring by two methyl groups; R_1 is chloro; R_2 and R_3 are hydrogen, then R cannot be a methyl group.

4,526,724

PROCESS FOR THE PREPARATION OF ZERO VALENT BIS-ARENE TRANSITION METAL COMPOUNDS

Dale G. Pillsbury, Elburn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 30, 1983, Ser. No. 537,840
Int. Cl.³ C07F *9/00*, *7/28*, *11/00*
U.S. Cl. 556—43 **10 Claims**

1. A process for the preparation of a zero valent bis-arene transition metal compound which comprises reducing a bis-arene transition metal (I) compound with a highly-electropositive metal of Group IA or IIA of the Periodic Table of Elements in a substantially anhydrous ether solvent in a substantially inert atmosphere.

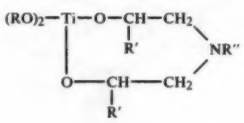
4,526,725

CATALYST COMPOSITION AND METHOD FOR THE MANUFACTURE OF ESTERS

Don L. Deardorff, 43 Gould Pl., East Greenwich, R.I. 02818

Filed Apr. 7, 1983, Ser. No. 482,926
Int. Cl.³ C07F *7/28*; C07C *67/08*, *67/48*
U.S. Cl. 556—56 **8 Claims**

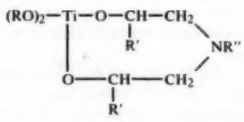
1. A catalyst composition comprising an organotitanate compound represented by the formula



where R is alkyl having four to eighteen carbon atoms, R′ is hydrogen or alkyl having one to four carbon atoms and R″ is hydrogen or alkyl having one to ten carbon atoms.

4. A process for preparing a refined ester which comprises:

(a) reacting one or more mono or di-carboxylic acids or anhydrides or trimellitic anhydrides with excess of aliphatic alcohol in the presence of a catalytically effective amount of an organotitanate catalyst represented by the structural formula:



wherein R is alkyl containing from 4 to 18 carbon atoms, R′ is hydrogen or alkyl groups having 1 to 4 carbon atoms and R″ is hydrogen or alkyl having 1 to 10 carbon atoms,

(b) removing the water of esterification until esterification is essentially complete,

(c) removing excess aliphatic alcohol and forming insolubles containing catalyst residues by steam distillation, and titanium catalyst residues by filtration.

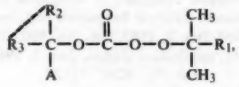
(d) separating a purified ester product from the resulting titanium catalyst residues by filtration.

4,526,726
TERTIARYALKYL PEROXYCARBONATES

Robert H. Tang, Norton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 430,051
Int. Cl.³ C07C *179/18*
U.S. Cl. 260—463 **4 Claims**

1. An organic peroxycarbonate of the graphic formula:



wherein R_1 is a C_1–C_{14} alkyl, phenyl or benzyl, R_2 and R_3 are each selected from the group consisting of C_1–C_4 alkyl, C_5–C_7 cycloalkyl, C_1–C_4 alkyl substituted C_5–C_7 cycloalkyl, or participate in a cycloalkyl group of from 5 to 7 carbon atoms, provided that when one of R_2 and R_3 is a cycloalkyl group, the other is a C_1–C_4 alkyl, A is a cyano group.

4,526,727
PROCESS FOR PREPARATION OF AN S-ALPHA-CYANO S-ALPHA-ISOPROPYLPHENYLACETATE

Walter L. Petty, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 460,334, Jan. 24, 1983, abandoned. This application Mar. 5, 1984, Ser. No. 585,963
Int. Cl.³ C07C *121/75*
U.S. Cl. 260—465 D **21 Claims**

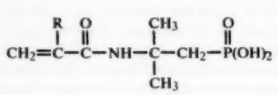
2. A method for the preparation of an "A-alpha" single stereoisomer of an S-alpha-cyano-3-phenoxybenzyl S-alpha-isopropylphenylacetate in substantially pure form or of a mixture enriched therein, which comprises treating a racemic R,S-alpha-isopropylphenylacetic acid or reactive derivative thereof with an S-alpha-cyano-3-phenoxybenzyl alcohol or a mixture enriched therein to give a phenylacetate "alpha" isomer mixture, precipitating crystals of an S-alpha-cyano-3-phenoxy-benzyl S-alpha-isopropylphenylacetate from the mixture and recovering said crystals.

4,526,728
2-ACRYLAMIDO- AND 2-METHACRYLAMIDO-2-METHYL PROPANEPHOSPHONIC ACIDS AND THEIR SALTS, PROCESS FOR THE PREPARATION THEREOF, AND USE THEREOF FOR THE MANUFACTURE OF COPOLYMERS

Manfred Finke, Kelkheim; Walter Rupp, Königstein, and Erwin Weiss, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 477,142, Mar. 21, 1983, abandoned. This application Apr. 5, 1984, Ser. No. 596,895
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210775; Apr. 16, 1983, 3313819
Int. Cl.³ C07F *9/38*; C08G *63/00, 63/44*
U.S. Cl. 260—502.5 R **1 Claim**

1. Acrylamido- and Methacrylamido-2-methylpropanephosphonic acids of the formula



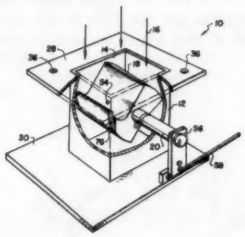
(I)

and the salts thereof wherein R is hydrogen or methyl.

4,526,729
VORTEX CARBURETOR

Alfred J. Braun, Country Rte. 1, Box 46, Mineral Springs Rd., Warnersville, N.Y. 12146; Aron Burdick, P.O. Box 87, N. Hoosick, N.Y. 12133, and Henry A. Scarton, 43 S. Lake Ave., Troy, N.Y. 12180

Filed Jan. 26, 1983, Ser. No. 460,998
Int. Cl.³ F02M *9/08*
U.S. Cl. 261—36 A **9 Claims**



1. A high velocity carburetor comprising:

conduit means defining an air flow conduit for carrying a flow of air in a flow direction;

a valve member in said air flow conduit and movably mounted to said conduit means from a closed position for reducing air flow in said conduit to an open position for increasing air flow in said conduit, said valve member having a curved air flow conducting surface facing toward the air flow direction with said valve member in at least one of its closed and open positions;

fuel metering means connected to said valve member for providing fuel to said curved air flow conducting surface;

said valve member being J-shaped and having an exterior surface facing the air flow direction in the closed position of said valve member which forms said curved air flow conducting surface, said J-shaped valve member having opposite cylindrical surfaces centered about an axis of rotation of said valve member in said conduit means, said valve member having a toe end at a base of its J-shape with cut-out portions forming air passage ports in said air flow conduit for passage of air with said valve member in its closed position, and

said J-shaped valve member further having a surface opposite said curved air flow conducting surface with a downstream flat portion and an upstream flat portion in the air flow direction, said upstream flat portion being at a rake angle with respect to said downstream portion for establishing air turbulence downstream of said valve member in said air flow direction.

4,526,730
HOME CARBONATING APPARATUS

Daniel M. Cochran, Rte. 5, Wheller Rd., WL-9, and William H. Wyttenbach, Rte. 5, Wheller Rd., WL-12, both of Louisville, Tenn. 37777

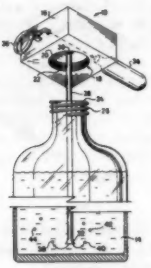
Filed Jan. 31, 1983, Ser. No. 462,556
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—121 R **13 Claims**

11. Apparatus for adding carbon-dioxide (CO_2) to consumable liquids contained in a container having an aperture of a selected size and shape, said apparatus comprising:

a unitary and solid housing defining a threaded connecting cavity for securing said housing to said aperture of said liquid container in a gas-tight manner, said housing further defining a cartridge cavity and a single fluid pathway extending between a first port terminating at said connecting cavity and a second port terminating at said cartridge cavity, said pathway being the sole fluid passage in said housing;

gas conduit means having a first and further end, said first end of said gas conduit permanently connected in a gas tight manner to said fluid pathway at said first port such that when said housing is secured to said liquid container said further end of said gas conduit means extends in to the interior of said liquid container so that a continuous gas tight pathway exists from said further end of said gas conduit, through said conduit, through said pathway in said housing to said cartridge cavity;

cover means for selectively opening and closing said cartridge cavity to provide pressurized sealing thereof;



a one shot disposable cartridge having a frangible portion and a shape suitable for being received in said cartridge cavity, said one shot sealed cartridge containing carbon-dioxide (CO_2) under pressure; and

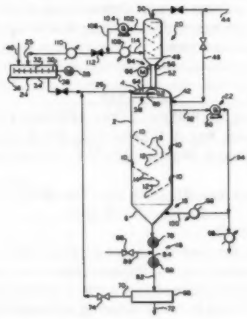
actuating mechanism for rupturing said frangible portion of said one shot disposable cartridge when said cartridge is in said sealed condition for containing pressure such that said pressurized carbon dioxide escapes from said cartridge cavity through said pathway in said housing and out of said further end of said gas conduit so that bubbles of pressurized CO_2 move up through a consumable liquid contained in said liquid container thereby carbonating said liquid.

4,526,731

PARTICULATING MATERIALS

E. Webb Henderson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 29, 1983, Ser. No. 556,221
Int. Cl.[3] B29C *6/00*
U.S. Cl. 264—5 **18 Claims**



1. A process comprising

(a) pelleting carbon black with a liquid pelleting fluid to form wet pellets of carbon black and pelleting fluid; and

(b) drying the wet pellets with hot vapors of said pelleting fluid from an extraneous source;

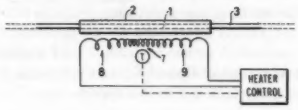
wherein said pelleting fluid is characterized by a heat of vaporization of less than 25,000 BTU/FT[3] and a normal boiling point in the range of −50° F. to 300° F.

4,526,732

METHOD OF HEATING THERMAL SHRINKAGE TUBE AND APPARATUS THEREFOR

Toshiaki Kakii; Yuichi Toda; Koichiro Matsuno; Yuichi Usui, all of Kanagawa, and Michito Matsumoto, Ibaraki, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Sumitomo Electric Industries Ltd., both of, Japan

Filed Jun. 3, 1983, Ser. No. 500,671
Claims priority, application Japan, Jun. 4, 1982, 57-95863
Int. Cl.[3] B29C *27/20*
U.S. Cl. 264—2.7 **10 Claims**



1. A method of heating a thermal shrinkage tube, comprising the steps of successively increasing the temperature thereof beginning from a central portion of the tube and progressing to opposite ends of the tube to achieve a gradual temperature gradient from the central portion of said tube to said opposite ends, to thereby successively shrink said tube from the central portion thereof to the opposite sides thereof; using a single heater in which the heating density of said heater for heating the thermal shrinkable tube is varied longitudinally with respect to the tube; detecting a change in temperature of said heater and controlling the temperature of said heater in response to said detected change in temperature.

5. An apparatus for heating a thermal shrinkage tube, comprising; a heater for heating the thermal shrinkage tube having a central portion and two end portions, said heater having a temperature distribution formed longitudinally with respect to the tube such that the temperature is high at said central portion relative to said end portions wherein said heater heats the entire thermal shrinkage tube simultaneously, establishing a temperature gradient from the central portion of said tube to said end portions and means for detecting the temperature of said heater and controlling said heater in response to said detected temperature.

4,526,733

MELTBLOWN DIE AND METHOD

Jark C. Lau, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 17, 1982, Ser. No. 442,486
Int. Cl.[3] B29F *3/04*
U.S. Cl. 264—12 **15 Claims**

1. In a method of forming a nonwoven web comprising the steps of:

(a) providing a molten thermoplastic polymer,

(b) spinning said molten polymer through one or more die tip orifices,

(c) contacting said spun polymer while hot as it exits said die tip orifice or orifices with a fluid stream to form filaments and attenuate said filaments into microfibers having an average diameter in the range of up to about 10 microns,

(d) collecting said drawn filaments, and

(e) bonding said filaments to form an integrated web,

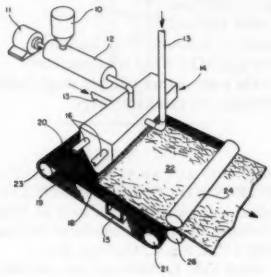
the improvement wherein said fluid stream is provided at about the lowest temperature of available fluid without significant artificial cooling when contacting the polymer, said low temperature fluid stream is insulated from said molten polymer at the die tip, and the forming distance is about 8 inches or less.

7. Apparatus for forming meltblown filaments comprising,

(a) means for receiving a molten polymer,

(b) a die communicating with said receiving means through a chamber to one or more die tip orifices through which said molten polymer may be spun,

(c) fluid supply means adjacent said orifice for directing a fluid at about the lowest temperature of available fluid without artificial cooling against said spun polymer as it



exits said die tip orifice or orifices to form filaments and attenuate said filaments into microfibers having an average diameter in the range of up to about 10 microns,

(d) insulation between said chamber and said fluid supply means at said die tip, and

(e) means for collecting said filaments at a distance of about 8 inches or less from said die tip.

4,526,734

PROCESS FOR THE PRODUCTION OF SILICON CARBIDE SINTERED BODIES

Ryo Enomoto, Ohgaki, Japan, assignor to Ibigawa Electric Industry Co., Ltd., Japan

Filed Feb. 26, 1982, Ser. No. 352,477

Claims priority, application Japan, Mar. 5, 1981, 56-30551; Mar. 5, 1981, 56-30552

Int. Cl.³ C04B *35/34*

U.S. Cl. 264—13 **44 Claims**

1. A process for producing a silicon carbide sintered body comprising the steps of:

(a) charging a sintering raw material consisting essentially of a substantially non-soluble silicon carbide fine powder and a sintering aid into a dispersion medium selected from the group consisting of benzene, cyclohexane and water, together with a substance selected from a group consisting of a molding assistant and a deflocculating agent to form a uniform suspension such that a volume ratio of solid content composed of said silicon carbide fine powder and sintering aid in said suspension is not more than 15%;

(b) spray freezing said suspension in an atmosphere held at a temperature lower than a melting temperature of said dispersion medium to obtain frozen granulates:

(c) freeze drying said frozen granulates for sublimation of said dispersion medium to obtain a powdery dried mixture;

(d) shaping said powdery dried mixture into a green body of an optical form; and

(e) sintering said green body without pressing.

4,526,735

PROCESS FOR PRODUCING FIBROUS ASSEMBLY

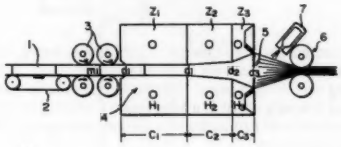
Susumu Norota, Ibaraki; Yasuhiko Segawa, Iwakuni; Tsutomu Kiriyama, Matsuyama; Shingo Emi, Daito; Tadasi Imoto, and Tetsuo Yamauchi, both of Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 9, 1983, Ser. No. 465,339

Claims priority, application Japan, Feb. 9, 1982, 57-18167; Feb. 9, 1982, 57-18168

Int. Cl.³ B29F *3/08*

U.S. Cl. 264—27 **16 Claims**



1. A process for producing a fibrous assembly by extruding at least one fiber-forming polymer through a spinneret having numerous small openings, said process comprising using a die equipped with a spinneret having numerous closely spaced small openings having an opening ratio (α), defined by the following equation, of at least 30%,

$$\alpha = \frac{V_a - V_f}{V_a} \times 100\,(\%)$$

wherein V_a (cm^3) is the total apparent volume of the spinneret which is taken within 1 cm^2 of the porous portion of the spinneret and V_f(cm^3) is the total volume of partitioning members defining the small openings which is taken within 1 cm^2 of the porous portion of the spinneret;

continuously stuffing at least one fiber-forming polymer in the form of a shaped mass into said die, said shaped mass having compression resistance such that at least in the initial stage of its stuffing into the die, it substantially retains its form in resistance to the stuffing pressure, and said shaped mass having such a shape that it measures more in one direction than in another; passing through the spinneret an electric current sufficient to give said fiber-forming polymer Joule heat required for cutting said polymer by partitioning members defining the numerous small openings of the spinneret; and taking up the cut fiber-forming polymer as fine streams.

4,526,736

PROCESS AND APPARATUS FOR MANUFACTURING FLEXIBLE FOAMED ARTICLES

Alonzo H. Searl, Fort Worth; Granville J. Hahn, and Raleigh N. Rutledge, both of Big Spring, all of Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Jun. 30, 1982, Ser. No. 393,910

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—53 **10 Claims**

1. A process for forming a foamed polymer article having low bulk density, high impermeability, good flexibility, and imperviousness to chemical attack, said process comprising:

selecting a thermoplastic polymer having a a predetermined solubility parameter;

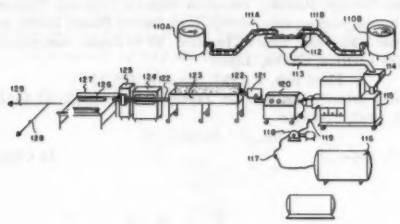
blending with said polymer, elastomer particles having a solubility parameter close to that of said polymer;

said blend characterized by having a Brabender viscosity

change of about 100–200 meter-grams per degree F. at a temperature corresponding to a Brabender viscosity in said blend, when melted, of about 1500–2500 meter-grams;

subjecting said blend to mechanical working to melt said blend under shear;

injecting into said melted blend a foaming agent having a



preselected gas-liquid phase change temperature, low toxicity, and being relatively non-flammable;

allowing said melted blend to foam in response to gasification of said foaming agent at a temperature which provides effective closed-cell formation in a viscosity range of 1500–2500 meter-grams; and,

extruding and cooling said foamed blend into a finished article.

4,526,737

METHOD OF MAKING MOLDED ARTICLES

Kurt Held, Alte Strasse 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed Jan. 14, 1983, Ser. No. 458,013

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1982, 3200914

Int. Cl.³ B29G *7/00*

U.S. Cl. 264—112 **10 Claims**

1. In a method of molding particleboard or fiberboard from wood and plant matter particles and mineral fibers comprising:

(a) blending said particles with an organic bonding agent, a polycondensation hardening agent and a reaction accelerator for said hardening agent,

(b) placing a mat layer of said mixture within a heated pressing means,

(c) pressing said mat to bond the particles into said board form, the improvement comprising:

(d) prior to step (a) separating the particulate material into two portions A and B,

(e) wetting the surface of the portion A particles only with the bonding agent,

(f) wetting the surface of the portion B particles only with the reaction accelerator,

(g) introducing the particles of the portion A and the portion B separately and in a random manner into a mold forming a loosely layered mat, and

(h) compressing the loosely layered mat formed of the portions A and B within the mold to intimately associate the materials and thereby initiate the reaction of the accelerator, and compact and bond the particles into a molded board.

4,526,738

POLYESTER FIBER AND METHOD FOR THE PRODUCTION THEREOF

Takehiko Miyoshi, Mishima; Tadayuki Matsumoto, Otu, and Keizo Sano, Musashino, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 512,206

Claims priority, application Japan, Jul. 9, 1982, 57-118440

Int. Cl.³ D01D *11/06*; **C08G** *63/70*; **B28B** *3/20*

U.S. Cl. 264—176 F **12 Claims**

8. A method for producing a polyester fiber, which method includes spinning a copolyester having a degree of polymerization of from 82 to 105, the copolyester including an acid component, and a glycol component, 1.0 to 2.0 mol percent of said acid component being metal sulfoisophthalic residues and 0.5 to 1.9 weight percent of the copolyester being glycol residues provided by a glycol having a molecular weight of from 400 to 6000 which spinning is effected by a spinneret under the following conditions,

Shear rate $(\gamma) \leqq 10^4 \text{ sec}^{-1}$

Spinning draft ratio $\leqq 250$

Back pressure of spinneret $\geqq 40 \text{ kg/cm}^2$

Shear stress $(\zeta) \leqq (Q+0.7) \times 10^7 \text{ dyne/cm}^2$

wherein Q is the mass output rate per single hole (g/min), and thereafter drawing the resultant fibers.

4,526,739

PROCESS AND APPARATUS FOR PRECASTING PRESTRESSED-CONCRETE WORKPIECES

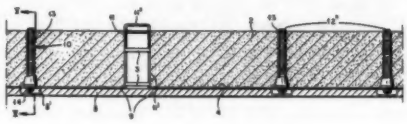
Antonio Migliacci; Giancarlo Bono, both of Milan, and Piero Tognoli, Gorlago, all of Italy, assignors to Industria Prefabbricati Affini I.P.A. S.p.A., Gorlago, Italy

Filed Feb. 1, 1983, Ser. No. 462,900

Claims priority, application Italy, Feb. 4, 1982, 19448 A/82

Int. Cl.³ B28B *23/06*

U.S. Cl. 264—228 **3 Claims**



1. A process for precasting workpieces of prestressed concrete containing prefabricated internally threaded screw anchors, comprising the steps of:

(a) providing a form of a shape corresponding to that of at least one workpiece with a horizontal nut fixedly secured to the bottom of said form;

(b) securing reinforcing armatures under tension to said form above said bottom;

(c) removably attaching a prefabricated screw anchor to said form by threading a headed bolt from above through the screw anchor into engagement with said nut, said bolt passing with clearance through the screw anchor without engaging the internal thread thereof;

(d) pouring concrete into the form around said armatures and said screw anchor;

(e) allowing the poured concrete to harden into a rigid workpiece;

(f) detaching said bolt from said nut;

(g) disconnecting said armatures from said form to prestress the workpiece; and

(h) extracting the workpiece from said form, said bolt being held centered in said insert by a sleeve resting on said bottom, the extraction of the workpiece in step (h) being accomplished with the air of a lifting implement passed through said screw anchor into engagement with said sleeve.

4,526,740

METHOD OF FORMING A RING OF VISCOUS MATERIAL AGAINST A SUBSTRATE

Victor J. Adams, Tempe, and Frank Polka, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 378,026, May 13, 1982, Pat. No. 4,480,983.

This application Oct. 18, 1983, Ser. No. 542,939

Int. Cl.³ B29F *3/04*

U.S. Cl. 264—259 **1 Claim**

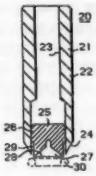
1. A method for forming a ring of viscous material on an article comprising the steps of:

extruding the viscous material from a collet having a cylin-

drical member and an insert, each with a relatively small surface area in cross-section at the end thereof;

terminating said extrusion when a bead forms in the extruded material;

contacting said material to said article,



slightly compressing said material by extruding more viscous material from said collet; and

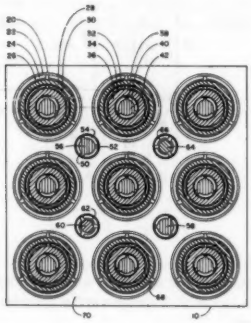
withdrawing said collet to separate the material from said collet.

4,526,741

FUEL ASSEMBLY FOR THE PRODUCTION OF TRITIUM IN LIGHT WATER REACTORS

William E. Cawley, and Turner J. Trapp, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 10, 1983, Ser. No. 503,129
Int. Cl.³ G21C *3/00*
U.S. Cl. 376—185 **7 Claims**



1. A nuclear fuel assembly comprising:

(a) a square array of first subassemblies; and

(b) a square array of second subassemblies; wherein the second subassemblies are dimensionally smaller than the first subassemblies, the second subassemblies are located within the interstices between the first subassemblies, and wherein each first subassembly comprises in concentric arrangement;

(c) an outermost containment tube;

(d) a first annular channel for the passage of cooling water;

(e) a tubular target element comprising lithium bearing material and surfaced with inner and outer layers of zirconium cladding;

(f) a second annular channel for the passage of cooling water;

(g) a tubular fuel element comprising enriched uranium and surfaced with inner and outer layers of zirconium cladding;

(h) a third annular channel for the passage of cooling water; and

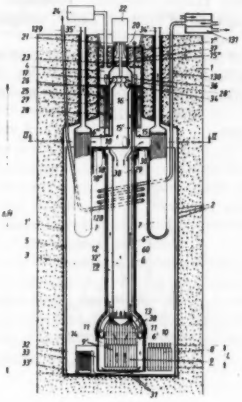
(i) an innermost rod of zirconium neutron spectrum shifting material.

4,526,742

NUCLEAR REACTOR PLANT

Kare Hannerz, Västerås, Sweden, assignor to AB Asea-Atom, Västerås, Sweden

Filed Mar. 25, 1982, Ser. No. 361,641
Claims priority, application Sweden, Mar. 30, 1981, 8102000
Int. Cl.³ G21C *9/00*
U.S. Cl. 376—282 **12 Claims**



1. In a nuclear reactor plant of the type including a pool filled with a neutron-absorbing pool liquid; a reactor vessel within the pool and enclosing a water filled reactor core provided with cooling channels, the reactor vessel including an inlet chamber communicating with the pool liquid via a lower shutdown opening and an outlet chamber communicating with the pool liquid via an upper shutdown opening, a vertical distance being measured between the lower and upper shutdown openings; heat exchange means; outlet means connecting said heat exchange means and said outlet chamber; inlet means connecting said inlet chamber to said heat exchange means; a circulating pump in the primary circuit of the reactor for providing, during normal operation of the reactor, a substantially constant flow of reactor cooling water through the core; a heat insulating layer covering most of the total pool liquid-facing surface of reactor components belonging to said primary circuit and disposed in said pool; the reactor core, in addition to being included in the primary circuit of the reactor plant, being included in a shutdown circuit which comprises the inlet chamber, the lower shutdown opening, the pool, the upper shutdown opening and the outlet chamber, the shutdown circuit having an inherent flow-driving tendency which, when cooling water flows through the reactor core, causes an inherent pressure difference to prevail in the shutdown circuit, the inherent pressure difference being counteracted and balanced by the pressure drop prevailing across the reactor core due to the flow therethrough of reactor cooling water, so that no significant supply of pool liquid to the primary circuit takes place, the improvement comprising:

said reactor vessel being filled during normal operation with cooling water which extends along a portion greater than one half the length of said vertical distance;

pool cooler means disposed in said pool for cooling said pool liquid to a temperature at least 50 degrees Celsius lower than the temperature of said cooling water flowing from said outlet chamber and

said pool liquid and said cooling water extending respectively, within said pool and said reactor vessel to levels

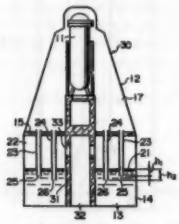
sufficiently above said reactor core so that a first static pressure exerted by a theoretical column of cooling water extending inside said reactor vessel and having a height which is equal to said vertical distance is lower than a second static pressure exerted by a theoretical column of pool liquid of the same height as said theoretical column of cooling water, the difference between said second static pressure and said first static pressure being more than 60% of said pressure drop prevailing across said reactor core.

4,526,743

CONTAINMENT VESSEL FOR A NUCLEAR REACTOR

Shozo Yamanari; Tetsuo Horiuchi; Toshihiko Sugisaki, and Kenji Tominaga, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 744,239, Nov. 23, 1976, abandoned.
This application Jul. 28, 1980, Ser. No. 172,950
Claims priority, application Japan, Dec. 26, 1975, 50-154940
Int. Cl.³ G21C *9/00*
U.S. Cl. 376—283 **9 Claims**



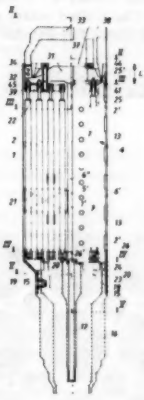
1. A containment vessel for a nuclear reactor comprising a dry well mounting therein a pressure vessel containing the nuclear reactor and having a vertically extending center line, non-condensable gases normally being present in an internal space of said dry well, a pressure suppression chamber annularly arranged to surround the center line of said pressure vessel and containing a pool of coolant, a partition separating said dry well from said pressure suppressing chamber, a pedestal extending from said pressure suppressing chamber through said partition into said dry well for supporting within said dry well said pressure vessel containing said nuclear reactor, and vent pipe means for releasing therethrough into said pool of coolant within said pressure suppression chamber steam which will be discharged from said pressure vessel into the internal space of said dry well as a result of an accident, said vent pipe means comprising a plurality of separated and individually mounted vent pipe members each inserted into said pool of coolant and having at least one exhaust port opening in said pool of coolant, said vent pipe members each continuously communicating the internal space of said dry well with said pool of coolant, said vent pipe members each being constructed and arranged such that said at least one exhaust port is immersed in said pool of coolant at all times even if the internal pressure of said dry well becomes lower than the pressure prevailing in a space formed within said pressure suppression chamber and disposed above a liquid level of said pool of coolant, the improvement comprising said vent pipe means being arranged for inhibiting sudden initial increases of pressure in said pressure suppression chamber resulting from transient release of said non-condensable gases into said coolant through said vent pipe means occurring as a result of an accident and enabling the pressures applied to walls of said pressure suppression chamber due to the transient release of said non-condensable gases to become balanced about the center line of said pressure vessel, said vent pipe members of said vent pipe means being divided into a plurality of groups in such a manner that said vent pipe members of different groups differ from one another in the length of submerged portions of said vent pipe members interposed between the liquid level of said pool of coolant within said pressure suppression chamber and said at least one exhaust port of said vent pipe members for inhibiting sudden initial increases of pressure in said pressure suppression chamber resulting from the transient release of said non-condensable gases into said coolant through said vent pipe members occurring as a result of an accident, said vent pipe members of said vent pipe means being arranged in said pressure suppression chamber in such a manner that the pressures applied to the walls of said pressure suppression chamber due to the transient release of said non-condensable gases become balanced about the center line of said pressure vessel, and communicating means for permitting an internal spaced formed in said pedestal to communicate only with said space formed in said pressure suppressing chamber and disposed above the liquid level of said pool of coolant.

4,526,744

FUEL ASSEMBLY FOR A BOILING WATER REACTOR

Bo Borrman; Lars Leine; Olov Nylund, and Bengt Ode, all of Västerås, Sweden, assignors to AB Asea-Atom, Västerås, Sweden

Filed Apr. 28, 1982, Ser. No. 372,765
Claims priority, application Sweden, May 15, 1981, 81030579
Int. Cl.³ G21C *3/34*
U.S. Cl. 376—440 **7 Claims**



1. A fuel assembly for a boiling water reactor, comprising:
a base provided with a downwardly directed inlet opening for coolant;
a fuel channel fixedly attached to and extended upward from said base, said fuel channel having a vertical longitudinal axis, said fuel channel having lifting lugs attached to said fuel channel and adapted for lifting the entire fuel assembly, and said fuel channel being divided into four quadrants;
a lifting plate laterally positioned within said fuel channel at an upper portion of said fuel channel, said lifting plate comprising a handling member to be grasped during a lifting operation;
four bottom grids positioned within said fuel channel and supported by said base;
a plurality of vertical fuel rods positioned within said fuel channel and supported at their lower ends by said bottom grids, said fuel rods comprising four separate, partial bundles of fuel rods with a partial bundle for each of said four bottom grids, each partial bundle being surrounded by one of said quadrants, the majority of the fuel rods in each partial bundle being supported on a bottom grid with freedom of movement in a direction vertically upwards, at least one of the fuel rods in each partial bundle being a tie

rod attached to a bottom grid with the ability to transmit tensile force to the bottom grid;

a plurality of spaces between said four partial bundles, said spaces being each provided with channel walls extending along a length greater than half the longitudinal length of said fuel rods, said channel walls extending below said lifting plate, said channel walls defining vertical flow paths for moderator water while preventing horizontal flow of said moderator water between said vertical flow paths and the interiors of said four bundles;

four top grids positioned within said fuel channel and engaged with the uper ends of all said fuel rods all of all said partial bundle,said majority of fuel rods in each said partial bundle also being engaged with one of said four top grids with freedom of movement in a direction vertically upwards, said at least one tie rod being attached to a top grid with the ability to transmit tensile force from the top grid to the bottom grid; and

means accessible from above the fuel assembly for releasably attaching said lifting plate to said top grids whereby said lifting plate is attached to all of said top grids,

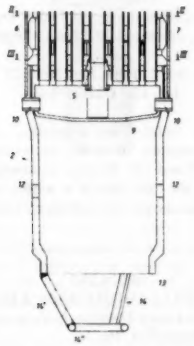
whereby upon application of tensile force to said handling member, all of said four bottom grids, fuel rods, four top grids and lifting plate can be removed as a unit from said fuel channel; or whereby upon removal of said lifting plate by releasing said means for attaching, said four partial bundles and their associated bottom grids and top grids can be removed as separate units from said fuel channel.

4,526,745

FUEL ASSEMBLY WITH A WATER FLOW SEPARATED FROM THE FUEL RODS

Olov Nylund, and Bertil Schölin, both of Västerås, Sweden, assignors to AB ASEA-Atom, Västerås, Sweden

Filed Aug. 25, 1981, Ser. No. 295,985
Int. Cl.³ G21C *3/32*
U.S. Cl. 376—444 **2 Claims**



1. A fuel assembly for a boiling water reactor, the assembly having a vertical centerline and comprising:

a lower lattice element;

a plurality of vertical fuel rods supported by said lattice element;

a fuel box surrounding said fuel rods, said fuel box having an exterior surface which in use of the fuel assembly faces the space which is within a boiling water reactor but is outside the fuel assembly;

a sleeve-like base with a downwardly facing inlet opening for reactor coolant to be flowed over the surfaces of said fuel rods, said base supporting said fuel box and said lattice element and also having a wall with an exterior surface which in use of the fuel assembly faces the space which is within a boiling water reactor but is outside the fuel assembly;

at least one vertical water channel located within said fuel box for a flow of water along but separated from said fuel rods, said vertical channel having a lower end;

at least one channel positioned above said downward-facing inlet opening, said channel being extended radially relative to said center line and opening at the side surface of the fuel assembly so that in use of the fuel assembly said radially extended channel opens to the space which is within the boiling water but is outside the fuel assembly;

means for hydraulically connecting said at least one radially extended channel to said lower end of said water channel to provide flow from the outside of said fuel assembly, through said radially extended channel and into said water channel, said means for hydraulically connecting comprising a hollow body, said hollow body receiving said flow only from said at least one radially extended channel, said at least one water channel receiving said flow only from said hollow body; and

at least one through-hole in said wall of said base, said through-hole opening outward through the side surface of the fuel assembly and being positioned above said inlet opening but below said at least one radially extended channel, said through-hole being hydraulically connected to said inlet opening of said base,

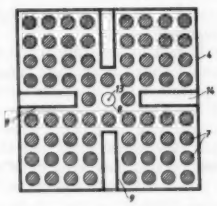
whereby in use of the fuel assembly coolant flows to said at least one water channel via said inlet opening, said at least one through-hole, the space which is within a boiling water reactor but is outside the fuel assembly, said at least one radially extended channel, and said menas for hydraulically connecting.

4,526,746

FUEL ASSEMBLY HAVING WATER PASSAGEWAY IN CHANNEL WALL

Bo Fredin, Västerås, Sweden, assignor to AB Asea-Atom, Västerås, Sweden

Filed Apr. 7, 1982, Ser. No. 366,269
Claims priority, application Sweden, May 4, 1981, 8102767
Int. Cl.³ G21C *3/30*
U.S. Cl. 376—444 **10 Claims**



1. A nuclear fuel assembly for a boiling water reactor comprising an assembly base hydraulically connected to a vertical fuel channel with a first pair and a second pair of opposite, mutually parallel channel walls, said first pair being perpendicularly oriented to said second pair, and a plurality of vertical tube elements disposed in said fuel channel, the majority of said tube elements being fuel rods and some of said tube elements being arranged to form at least two first rows and at least two second rows, each of said rows comprising a plurality of said tube elements arranged one after the other in a horizontal direction, said first rows being parallel to said first pair of channel walls and said second rows being parallel to said second pair of channel walls, said tube elements being positioned in said fuel channel in such a way that the vertical middle line of each of said tube elements runs through a corresponding nodal point in an imaginary square lattice, wherein each of said channel walls has an integral, middle wall portion

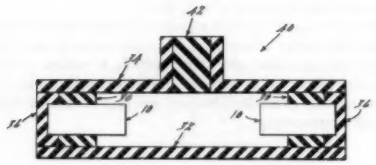
constituting an inwardly directed, hollow projection projecting inwardly beyond all other portions of the wall and at least two of said tube elements, said projection comprising an elongated, vertical internal passageway for providing a flow of moderator water, said vertical passageway constituting more than 50% of the length of said fuel rods, and said middle wall portion keeping the entire flow of moderator water flowing in said passageway separated from said fuel rods and preventing this water from making contact with the fuel rods, and wherein an intermediate row of said tube elements is arranged between the two projections of each pair of said mutually parallel fuel channel walls, said first rows and said second rows having at least four more of said tube elements than said intermediate rows.

4,526,747

PROCESS FOR FABRICATING PARTS SUCH AS GAS TURBINE COMPRESSORS

William P. Schimmel, Milford; Clifford S. Barker, Kalamazoo, and Dana P. Jones, Walled Lake, all of Mich., assignors to Williams International Corporation, Walled Lake, Mich.

Filed Mar. 18, 1982, Ser. No. 359,575
Int. Cl.³ B22F *7/08, 3/16, 5/04*
U.S. Cl. 419—8 **2 Claims**



1. A method of manufacturing a turbine wheel or the like comprising the steps of;

(a) mounting a plurality of preformed blades in a pair of radially spaced, concentric rings,

(b) filling the space between said rings and around said blades with an elastomeric material to form an elastomeric mold insert, having radially extending blades mounted therein,

(c) mounting said mold insert and blades between elastomeric top and bottom plates,

(d) sealing the radially outer face of said mold insert with an elastomeric material,

(e) filling the space radially inwardly of said mold insert with powdered metal through an aperture in one of said plates,

(f) sealing the aperture in said one plate with an elastomeric material to define a sealed elastomeric mold,

(g) cold isostatic pressing the powder within said mold,

(h) stripping said elastomeric mold and elastomeric mold insert from said pressed powdered metal and blades, and

(i) heating said powdered metal and blades to effect metallurgical bonding thereof.

2. The method of claim 1 including the additional step of hot isostatic pressing the powder metal-blade assembly.

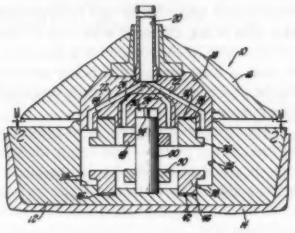
4,526,748

HOT CONSOLIDATION OF POWDER METAL-FLOATING SHAPING INSERTS

Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Continuation of Ser. No. 152,339, May 22, 1980, abandoned. This application Jul. 12, 1982, Ser. No. 397,359
Int. Cl.³ B22F *3/14*
U.S. Cl. 419—49 **3 Claims**

1. A method of hot consolidating powder in a heat container mass which is substantially fully dense and incompressible with at least a portion capable of plastic flow during pressing and having interior walls forming a closed cavity of a predetermined shape and volume for receiving powder with the interior walls being movable to reduce the volume of the cavity for compacting powder into an article comprising the steps of: disposing a shaping means in the cavity for defining a void in the article as the powder is compacted thereagainst, applying a force to the container to move the interior walls relative to one another to reduce the volume of the cavity while compacting the powder with a force response means between the shaping means and at least a portion of the interior walls of the cavity to prevent movement of the shaping means relative to that portion of the interior walls as the cavity is reduced in volume



until the powder thereagainst reaches a predetermined degree of compaction whereupon movement of the shaping means relative to that portion of the interior walls is allowed as the cavity is further reduced in volume to complete the compaction of the powder, and applying a force to the heated container until the mass of the container becomes substantially monolithic so that further application of the force causes further compaction as a result of fluid-like behaviour of the mass of the container due to the plastic flow of the mass of the container whereby the further compaction is isostatic.

4,526,749

TANTALUM-COLUMBIUM-MOLYBDENUM-TUNGSTEN ALLOY

Louis E. Huber, Jr., Allentown, and Harry D. Schwartz, Reiffton, both of Pa., assignors to Cabot Corporation, Kokomo, Ind.

Filed Jul. 2, 1984, Ser. No. 627,155
Int. Cl.³ C22C *27/02*
U.S. Cl. 420—427 **3 Claims**

1. A refractory metal alloy consisting essentially of, in weight percent, tantalum 56 to 68, molybdenum 1.5 to 5.0, tungsten 2.0 to 5.0 and the balance columbium plus normal impurities wherein the ratio Mo:W is within the range 0.5 to 2 to provide an outstanding combination of engineering properties.

4,526,750

NON-STAINING PALLADIUM BASED DENTAL ALLOY

Paul J. Cascone, Yorktown Heights, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 16, 1984, Ser. No. 571,305
Int. Cl.³ C22C *5/04*
U.S. Cl. 420—463 **3 Claims**

1. A single phase, gold and silver-free dental alloy consisting of about 4.0 weight % cobalt, about 8.5 weight % gallium, about 0.8 weight % ruthenium, iridium or rhenium and a balance of palladium.

2. A method of preparing a single phase dental alloy comprising mixing in a crucuble having walls of magnesia, zirconia or high purity alumina the following components in amounts based on the weight of said dental alloy:

(a) from 10 to 25% of a binary mixture of about 96 weight % palladium and about 4 weight % ruthenium, iridium or rhenium,

(b) from 23 to 26% of a binary mixture of about 65 weight of palladium and about 35 weight % gallium,

(c) from about 3 to about 4.5% cobalt and
(d) a balance of palladium,
and heating said components in said crucible in air to a temperature in the range of 1400° to 1440° C. until completely molten.

4,526,751
GERMICIDAL SOLUTIONS EFFECTIVE FOR SOLID SURFACE DISINFECTION

William J. Gartner, 153 Williamsburg Dr., Bartlett, Ill. 60103

Filed Dec. 9, 1983, Ser. No. 559,898
Int. Cl.³ A61K *31/79, 33/18*
U.S. Cl. 422—37 **15 Claims**

1. A germicidal solution effective for surface disinfection which comprises a polyvinylpyrrolidone-aqueous solution of elemental iodine, a water-soluble iodide, and potassium bromide, said solution containing a high concentration of elemental iodine in solution.

9. A method of disinfecting solid surfaces contaminated with bacteria, microorganisms, protozoa, molds, viruses and other contaminants which are susceptible to destruction or inactivation by elemental iodine which comprises applying to such solid contaminated surfaces a polyvinylpyrrolidone-aqueous solution of elemental iodine, a water-soluble iodide, and potassium bromide, said elemental iodine being present in said solution in proportions effective to destroy or inactivate said surface contaminants.

4,526,752
OXYGEN INDICATOR FOR PACKAGING

Daniel Perlman, 94 Oakland Ave., Arlington, Mass. 02174, and Henry Linschitz, 35 Riverside Dr., Waltham, Mass. 02154

Filed Dec. 16, 1982, Ser. No. 450,234
Int. Cl.³ G01N *21/78*
U.S. Cl. 422—56 **21 Claims**

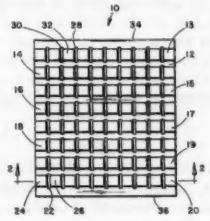
1. An oxygen indicator for use in an atmosphere free of oxygen, said indicator comprising a substrate carrying, in leuco state, a dye free of reducing agents and this reducing agent free dye being capable of irreversibly reacting with oxygen; said dye being characterized as being of the class which is reactive with oxygen to change from the leuco state to the colored state and which is reactive with reducing agent to change from the colored state to the leuco state.

4,526,753
MULTIPLE PROFILE REAGENT CARD

David L. Boger, South Bend, Ind.; Leighton C. Johnson, Edwardsburg, Mich., and Jerry T. Pugh, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jul. 6, 1983, Ser. No. 511,269
Int. Cl.³ G01N *21/78, 33/52*
U.S. Cl. 422—56 **1 Claim**

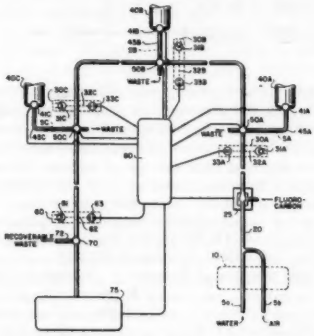
1. A multiple profile reagent card comprising multiple reagent impregnated matrices for simultaneously or sequentially performing multiple analyses of analyte wherein the matrices consist of multiple ribbons of reagent impregnated matrix material positioned parallel to each other on a substrate with slots cut completely through said ribbons and said substrate at spaced locations along each ribbon to define matrices along each ribbon, said ribbons being the same or different, said slots extending perpendicular to the length of the reagent impregnated ribbons to substantially prevent runover between adjacent matrices along each ribbon of matrix material, said ribbons of matrix material being applied in a continuous manner to the substrate and then separated by said slots to produce said matrices.



4,526,754
SAMPLE TRANSPORT SYSTEM

Donald A. Burns, Putnam Valley; Marvin Margoshes, Tarrytown, and Michael M. Cassaday, Peekskill, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jul. 30, 1982, Ser. No. 403,886
Int. Cl.³ G01N *35/08*
U.S. Cl. 422—82 **7 Claims**



1. A system for transporting in a carrier stream a plurality of liquid samples to be analyzed in at least one analyzer located at a receiving station, which comprises:
(a) a conduit having an inner surface;
(b) means for establishing and maintaining on said inner surface of said conduit a continuous coating of a first liquid, said first liquid being immiscible with a carrier stream and a plurality of liquid samples and preferentially wetting said inner surface;
(c) means for establishing and passing said carrier stream through said conduit, said carrier stream comprising an alternating sequence of gas segments and segments of a second liquid immiscible with said coating of first liquid on said conduit, said carrier stream being uninterrupted by said first liquid;
(d) a plurality of means for introducing said samples into selected ones of said gas segments of said carrier stream so as to intersect said selected gas segments said introducing means being located at spaced locations along said conduit; a detecting means which includes a detector associated with and positioned upstream of each of said sample introducing

means for detecting the passage of said selected gas segments and generating respective signals in response thereto;

(f) a receiving station including at least one analyzer and in fluid communication with said conduit for receiving said carrier stream and for analyzing said plurality of samples introduced therein in said at least one analyzer, said receiving station being spaced apart from said plurality of introducing means; and

(g) control means for receiving said signals from said gas segment detectors and controlling said plurality of introducing means to introduce said samples so as to intersect said selected gas segments in response to said signals.

4,526,755

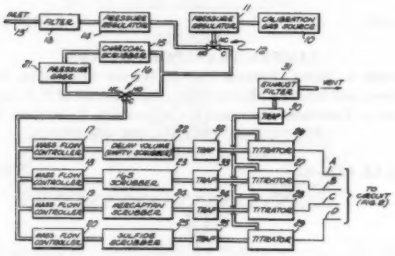
GAS ANALYZER OR THE LIKE

Arthur L Vincent, Monrovia; James R. Robinson, Phelan, and Ernst R. Ginkel, San Dimas, all of Calif., assignors to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Feb. 22, 1982, Ser. No. 351,238

Int. Cl.[3] **G01N** *27/04*

U.S. Cl. 422—90 **5 Claims**



1. A gas analyzer comprising: a source of a gas of interest; at least first and second scrubbers each having an inlet and an outlet, said first scrubber providing only a delay volume equal to that of said second scrubber, said second scrubber removing at least one compound from said gas of interest; first and second coulometric titrators connected from the outputs of said first and second scrubbers, respectively, to produce first and second electrical output signals of respective amplitudes A and B directly proportional to the total sulfur concentration in said gas, including said one sulfur compound, and said concentration minus that of said one compound, respectively; means to produce a signal of a magnitude E directly proportional to (A-B), said gas source being connected to said scrubber inlets, said signal amplitude E being directly proportional to the concentration of said one compound in said gas of interest.

4,526,756

DEVICE FOR INTERCONNECTING SPECIMEN COLLECTING TUBES

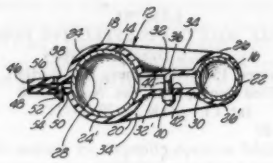
Johnson N. S. Wong, Rolling Hills, Calif., assignor to Evergreen Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 376,443, May 10, 1982, abandoned. This application Dec. 28, 1984, Ser. No. 687,040

Int. Cl. B01L *9/00*

U.S. Cl. 422—104 **8 Claims**

1. A device for retaining at least two specimen collecting tubes in a preselected spaced relationship, comprising an elongate structure having first and second arm positions joined by a flexible hinge portion, each of the arm portions defining a first arcuate surface engageable with a first specimen collecting tube and a second arcuate surface engageable with a second specimen collecting tube with the first and second arcuate portions of the respective arms being positioned symmetrically relative to said hinge portion, each of said arm portions further having a substantially flat surface portion extending between the first and second arcuate surfaces, said flat surface portion including means for connecting the arms to each other so that the flat surface portions between the arcuate surfaces are in a substantially parallel spaced apart relationship to confine the



tubes between the arm portions and second means for connecting the arms to each other at substantially the extremity of the arms remote from the hinge portion.

4,526,757

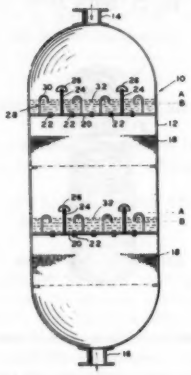
PULSED FLOW VAPOR-LIQUID REACTOR

Ramesh Gupta, Berkeley Heights, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 1, 1982, Ser. No. 437,905

Int. Cl.[3] **G05D** *9/00*; **B01J** *8/02, 8/04*

U.S. Cl. 422—106 **3 Claims**



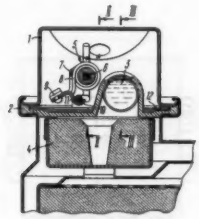
1. The method of improving catalyst wetting and utilization in a reactor having at least one fixed catalyst bed and a relatively constant inlet liquid flow rate and a co-current downward vapor flow therethrough and wherein said reactor is designed to be relatively large in diameter and short in height in order to minimize pressure drop and mass velocity therein, comprising the steps of providing a gas and liquid distributor tray above each catalyst bed in said reactor for establishing a primary distribution pattern and flow rate of vapor and liquid through each bed, said distributor tray having a plurality of primary liquid flow openings establishing a primary liquid flow rate through said tray less than said reactor inlet liquid flow rate, and automatically and periodically increasing the flow rate of liquid through each said distributor tray and bed by the activation of a plurality of siphon means on each tray to thereby periodically distribute added liquid upon the catalyst bed therebelow whereby a pulsed flow of liquid in said bed will be established and assist in maintaining said catalyst in a wetted condition throughout said bed.

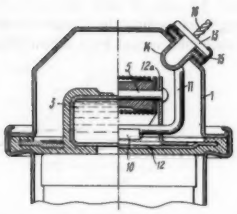
4,526,758

STARTING DEVICE FOR SELF-CONTAINED BREATHING APPARATUS

Anton S. Alengoz, ulitsa Artema, 108, kv. 27; Anatoly I. Artemenko, ulitsa Levitskogo, 5, kv. 8; Mikhail G. Danilevsky, ulitsa Artema, 163 b, kv. 48; Vladimir K. Kocherga, ulitsa Artema, 163 b, kv. 73; Viktor N. Luchko, ulitsa Slovatskaya, 1, kv. 120; Anatoly E. Margolis, bulvar Shkolny, 4, kv. 128; Vladimir K. Ovcharov, prospekt Kievsky, 5v, kv. 101, and Jury A. Shevchenko, ulitsa Lepeshinskogo, 5, kv. 2, all of Donetsk, U.S.S.R.

Filed May 19, 1983, Ser. No. 496,065
Claims priority, application U.S.S.R., Jan. 17, 1983, 3530201
Int. Cl.[3] A61M *15/00;* A62B *7/08*
U.S. Cl. 422—122 3 Claims





1. A breathing apparatus employing chemically-fixed oxygen, comprising:

a brick of oxygen generating material contained in a canister;

a resilient diaphragm which is positioned above said brick and is provided with a socket having a bore facing said brick;

an ampule containing an ignition liquid serving to liberate oxygen on contact with said brick, said ampule being accommodated in said socket of said resilient diaphragm;

a gas-tight cap located on said diaphragm at the side thereof opposite to the side facing said brick;

an ignition means serving to break said ampule, said ignition means being located on said diaphragm under said cap and including a spring-loaded lever with an ignition pin and a retainer holding said lever in a position ready for operation;

an opening in said cap, said opening located adjacent said lever when said lever is in the position ready for operation;

a blind resilient bushing which is fitted into said opening of said cap to seal off said opening and to extend inside said cap so as to contact said retainer of said ignition means;

a detent which interacts with said cap and is fitted into said resilient bushing so as to interact, through the wall of said bushing, with said retainer of said ignition means, keeping said lever in a position ready for operation;

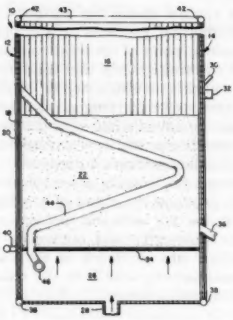
means for withdrawing said detent from said bushing.

4,526,759

FLUIDIZED BED REACTOR UTILIZING IN-BED HEAT EXCHANGER TUBES WHICH REGISTER WITH WATER WALL TUBES

Robert D. Stewart, Verona, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jun. 9, 1982, Ser. No. 386,478
Int. Cl.[3] F27B *15/00, 15/16;* B01J *8/24*
U.S. Cl. 422—143 4 Claims



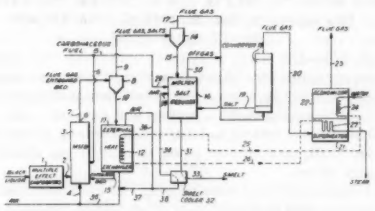
1. A fluidized bed reactor comprising a first series of tubes forming at least a portion of the walls of an enclosure; a bed of combustible particulate material disposed in said enclosure; a second series of tubes each of which has a first portion extending through said bed of particulate material, and a second portion extending between a pair of adjacent tubes of said first series; first and second header means connected to the upper and lower ends, respectively, of the tubes of said first and second series to form a water flow circuit including said first series of tubes and said second series of tubes for passing said water in a heat exchange relation with said bed of particulate material; and means for passing air through said bed of particulate material to fluidize and promote combustion of said material.

4,526,760

RECOVERY OF HEAT AND CHEMICAL VALUES FROM SPENT PULPING LIQUORS

Howard L. Empie, Jr., Goshen, N.Y., assignor to International Paper Co., New York, N.Y.

Division of Ser. No. 400,492, Jul. 21, 1982, Pat. No. 4,441,959.
This application Feb. 16, 1984, Ser. No. 580,918
Int. Cl.[3] D21C *11/12*
U.S. Cl. 422—185 2 Claims



1. An integrated apparatus for the recovery of energy and chemical values from spent pulping liquors comprising:

(a) an initial fluidized bed reaction chamber provided with means for combusting concentrated spent pulping liquor with air and a plurality of solid particulate materials, at least one of which is of finer particle size than another;

(b) means for separating the finer particle size inert particu-

late material from the gaseous and solid combustion products communicating with the top portion of said initial fluidized bed reaction chamber;

(c) a fluidized bed heat exchanger means external to said initial fluidized bed reaction chamber communicating with said means for separating the finer particle size inert particulate material;

(d) means for returning separated finer particle size inert particulate material to the initial fluidized bed reaction chamber communicating with the fluidized bed heat exchanger means;

(e) oxidation reactor means for further combusting said gaseous combustion products at a temperature greater than the melting point of the solid combustion products;

(f) means for carrying gaseous and solid combustion products of the initial combustion step to the oxidation reactor means, said means for carrying gaseous and solid combustion products communicating with the means for separating finer particle size inert particulate material from the gaseous and solid combustion products;

(g) reducer means for reducing at least a portion of the solid combustion products by action of a reducing agent in a molten inorganic salt mass and recovering a smelt; and

(h) means for recovering and conveying to the reducer means, molten salts produced in the oxidation reactor means communicating with both the reducer means and the oxidation reactor means.

4,526,761

APPARATUS FOR CHLORINATION OF MOLTEN MAGNESIUM CHLORIDE SALTS

Andrei B. Ivanov, prospekt Smirnova,59, kv.151; Vladimir I. Schegolev, ulitsa Korablestroitelei, 29, korpus 4,kv.252, both of Leningrad; Viktor A. Rudakov, ulitsa Pushkina, 15,kv.48, Ivano-Frankovskaya oblast.Kalush; Sergei P. Kosarev, Nalichnaya ulitsa, 39, korpus 1,kv.20; Elizaveta A. Grigorieva, ulitsa 3 Internatsionala, 68, kv.53, both of Leningrad; Alexandr T. Podanenko, ulitsa B.Khmelnitskogo,45,kv.69, Ivano-Frankovskaya oblast.Kalush; Oleg N. Romanenko, prospekt Lenina,6,kv.46, Ivano-Frankovskaya oblast.Kalush; Leonid P. Stavrov, ulitsa 50-letia VLKSM,8,kv.84, Ivano-Frankovskaya oblast.Kalush; Anatoly B. Kondratenko, ulitsa V.Tereshkovoi,15, Ivano-Frankovskaya oblast.Kalush; Konstantin D. Muzhzhavlev, ulitsa Zheleznovodskaya,48, kv.30, Leningrad; Vladimir G. Ovcharenko, prospekt Lenina,7"a", kv.9, Ivano-Frankovskaya oblast.Kalush; Grigory P. Khristjuk, ulitsa Karpinskogo, 16, kv.219, Leningrad; Alexei V. Vasiliev, ulitsa B.Khmelnitskogo,66, kv.57, Ivano-Frankovskaya oblast-.Kalush; Anatoly L. Garkavy, ulitsa 40-letia Oktyabrya, 49, kv.52, Ivano-Frankovskaya oblast.Kalush; Ivan G. Gachegov, deceased, ulitsa B.Khmelnitskogo,66,kv.61, late of Ivano-Frankovskaya oblast.Kalush, and by Lidia T. Gachegova, administrator, ulitsa B. Khmelnitskogo.66, kv. 61, Ivano-Frankovskaya oblast.Kalush, all of U.S.S.R.

Division of Ser. No. 251,173, Apr. 6, 1981, Pat. No. 4,415,538.
This application Jul. 20, 1983, Ser. No. 515,400
Int. Cl.[3] B01F *13/02*

U.S. Cl. 422—224 **2 Claims**

1. An apparatus for chlorination of molten magnesium chloride salts and the like, comprising a shell lined with a refractory material and having walls, a bottom and a cover,

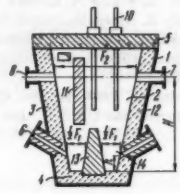
said walls, said bottom and said cover forming an interior of said shell, said interior being devoid of gas distribution grate means;

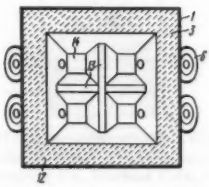
melt feed inlet means for feeding the melt into said shell interior, said melt feed inlet means being mounted in the upper portion of one of said walls;

chlorinated melt outlet means for moving the chlorinated melt from said shell interior, said chlorinated melt outlet means being mounted in the upper portion of another of said walls;

chlorine inlet means mounted in the lower portion of said walls,

said shell interior being tapered downwardly so that the clear opening at the height of said chlorine inlet means is not over 0.3 times the clear opening at the height of said melt feed inlet means and said melt outlet means and comprising two intersecting partitions mounted in said bottom, tapering upwardly, arranged at right angles to





each other and dividing said shell interior into four downwardly tapering chambers intercommunicating at their tops, said chlorine inlet means being mounted in said walls on both sides of one of said partitions, said partitions having a height exceeding the distance from said bottom to said chlorine inlet means by a factor of at least two.

4,526,762

RECOVERY OF VANADIUM FROM ACIDIC SOLUTIONS THEREOF

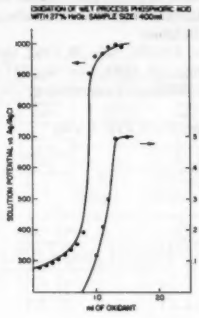
Richard A. Brown, Trenton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

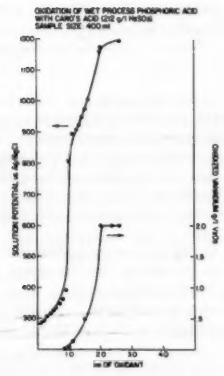
Filed Sep. 29, 1980, Ser. No. 192,132
Int. Cl.[3] C01G *31/00*

U.S. Cl. 423—63 **4 Claims**

1. The process of recovering vanadium from phosphoric acid in which at least part of the vanadium is in the +4 valence

state comprising: contacting the phosphoric acid with sufficient Caro's acid to oxidize the vanadium to the +5 valence



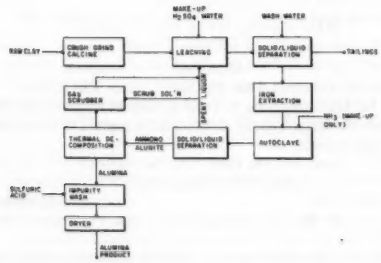


state and recovering the vanadium in the +5 state by solvent extraction.

4,526,763
PROCESS FOR THE PRODUCTION OF ALUMINA

Robert W. Bartlett, and Thomas R. Bolles, both of Tuscon, Ariz., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 3, 1982, Ser. No. 373,874
Int. Cl.³ C01F *7/26*
U.S. Cl. 423—112 **15 Claims**



1. A process for the production of alumina from an aluminous material comprising:

(a) providing said aluminous material

(b) leaching said aluminous material with an aqueous sulfuric acid solution to form a solid phase and a liquid phase containing aluminum sulfate;

(c) separating said solid phase from said liquid phase;

(d) reacting said liquid phase with ammonium ions at a temperature from about 150° to about 250° C. and a pressure from about 35 to about 575 psia to form an ammonoalunite precipitate, $NH_4Al_3(SO_4)_2(OH)_6$, and a liquid comprising sulfuric acid;

(e) separating said ammonoalunite precipitate from said liquor;

(f) thermally decomposing said ammonoalunite to produce said alumina and gaseous byproducts.

7. The process of claim 1 further comprising:

treating said aluminous solution with an organic liquid substantially immiscible with the aluminous solution and containing an organic extractant capable of preferential extraction of iron over aluminum whereby iron is extracted from said aluminous solution into said organic liquid.

4,526,764
SCRUBBER OPERATING METHOD FOR THE DESULFURIZATION OF FLUE GASES

Werner Stehning, Dorsten, Fed. Rep. of Germany, assignor to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserrückkühlanlagen GmbH & Co. Kommanditgesellschaft, Essen, Fed. Rep. of Germany

Division of Ser. No. 515,919, Jul. 20, 1983,. This application Feb. 16, 1984, Ser. No. 580,645
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227187
Int. Cl.³ C01B *17/00*
U.S. Cl. 423—242 **1 Claim**

1. A method of operating a scrubber for the desulfurization of a flue gas wherein the flue gas is passed in direct contact with an aqueous calcium containing scrubbing liquid in a washing zone in the scrubber above a sump, and scrubbing liquid is collected in said sump, said method comprising the steps of:

introducing oxygen into the liquid in said sump so as to form an oxidation zone at an upper portion of the sump;

normally circulating scrubbing liquid from said sump to said washing zone; and

after a standstill of said scrubber in which scrubbing liquid is retained in said sump and solids collect therein, withdrawing a portion of scrubbing liquid from an upper part of said sump and injecting the withdrawn portion of the scrubbing liquid into a lower part of said sump to entrain settled solids into movement, and thereafter restore the circulation of scrubbing liquid from said sump to said washing zone, the scrubbing liquid to be injected into said sump being withdrawn from said oxidation zone and being injected into said reaction zone, said oxygen being introduced into said sump through a grate at a location between said oxidation zone and said reduction zone; and

restricting the downward flow of scrubbing liquid from said oxidation zone to said reduction zone at said location.

4,526,765
METHODS FOR PREPARING AMORPHOUS ZIRCONIUM PHOSPHOSILICATE

Kathuhiko Ito, Kobe; Hiroshi Sugii, Osaka; Yukito Takata, Toyonaka, and Kyoichiro Kokubu, Suita, all of Japan, assignors to Daiichi Kigenso Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Aug. 4, 1983, Ser. No. 520,315
Claims priority, application Japan, Aug. 4, 1982, 57-136572
Int. Cl.³ C01B *25/00, 25/12, 33/20;* C01G *25/02*
U.S. Cl. 423—306 **59 Claims**

1. A process for producing an amorphous zirconium phosphosilicate represented by the formula $Zr(PO_4)_{2y}(SiO_2)_{2-}n'$-

H_2O wherein y is 0.02 to 2.00, z is 0.05 to 16.00 and n' is 0 to 10.00 comprising:

(i) preparing respective aqueous solutions of a zirconium compound, a phosphorus compound and a silicon compound in a P_2O_5/ZrO_2 mole ratio of 0.02 to 2.50 and a SiO_2/ZrO_2 mole ratio of 0.05 to 20.00;

(ii) mixing together said aqueous solutions so that the resulting slurry contains an end product in an amount of up to 20% by weight;

(iii) aging the resulting slurry containing the reaction product at about 5° to about 100° C. for about 1 to 240 hours;

(iv) washing the resulting precipitate;

(v) subjecting the precipitate to solid-liquid separation;

(vi) drying the wet cake obtained at a temperature of up to about 250° C.; and

(vii) optionally heating the dried cake at about 250° to about 950° C.

4,526,766
PRODUCTION OF RED PHOSPHORUS

Kevin P. Ryan, Gloucester, and Carl D. Yank, Buckingham, both of Canada, assignors to ERCO Industries Limited, Islington, Canada

Filed Dec. 13, 1983, Ser. No. 560,962
Int. Cl.³ C01B *25/01, 25/02, 25/04*
U.S. Cl. 423—322 **7 Claims**

1. A process for the production of red amorphous phosphorus, which comprises:

providing a mass of yellow phosphorus in an enclosed thermal conversion zone at ambient temperature,

heating said mass of yellow phosphorus to the boiling point thereof using a liquid heat transfer medium, said liquid heat transfer medium being in heat transfer relationship with said mass of yellow phosphorus and having an initial temperature sufficient to permit said yellow phosphorus to be heated thereby from said ambient temperature to said boiling temperature,

said heating of said yellow phosphorus to said boiling point initiating thermal conversion of yellow phosphorus to red phosphorus at said boiling point of yellow phosphorus, said thermal conversion producing exothermic heat of conversion,

permitting said thermal conversion to occur while simultaneously permitting yellow phosphorus to evaporate so as to remove said heat of conversion from said mass, said thermal conversion being permitted to continue until the degree of conversion of yellow phosphorus to red phosphorus no longer generates sufficient heat of conversion to evaporate yellow phosphorus from said mass, and

collecting the evaporated yellow phosphorus by removing the same from said thermal conversion zone and condensing the removed yellow phosphorus.

4,526,767
PROCESS FOR THE PRODUCTION OF ZSM-5 ZEOLITE

Joseph G. Robinson, Winchcombe, and David I. Barnes, Cheltenham, both of England, assignors to Coal Industry (Patents) Ltd., London, England

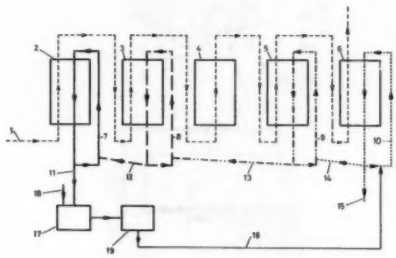
Filed Dec. 13, 1983, Ser. No. 560,926
Claims priority, application United Kingdom, Jan. 11, 1983, 8300662; May 20, 1983, 8314000
Int. Cl.³ C01B *33/28*
U.S. Cl. 423—329 **6 Claims**

1. A process for the production of crystalline ZSM-5 synthetic zeolite, comprising mixing a presursor for an alumina hydrate, a precursor for silica hydrogel, an alkali metal hydroxide and water together with an organic templating reagent selected from carboxymethylcellulose and cellulose hydroxyethyl ether, and thereafter heating the reaction product under autogenous conditions.

4,526,768
PROCESS FOR PRODUCING SULPHURIC ACID

Noël F. Felix, Wijgmaal-Leuven, and Guido C. Vermeylen, Edegem, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Continuation of Ser. No. 426,099, Sep. 28, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,079
Claims priority, application Luxembourg, Oct. 26, 1981, 83715
Int. Cl.³ C01B *17/90*
U.S. Cl. 423—531 **15 Claims**



1. A process for producing sulphuric acid that is substantially free of mercury from a roasting gas containing SO_2, water-vapor and mercury comprising the steps of

(a) contacting the gas with circulating sulphuric acid so as to produce a dry gas, thereby diluting the acid and simultaneously lowering the mercury content of the gas, part of the mercury present in the starting gas passing into the sulphuric acid,

(b) compensating for the concentration loss in the acid circulating in step (a) by adding thereto oleum and tapping from step (a) a diluted sulfuric acid;

(c) subjecting the dry gas resulting from step (a) to a catalytic oxidation treatment so as to produce a gas that is rich in SO_3,

(d) contacting the gas rich in SO_3 from step (c) with circulating oleum, thereby lowering further the mercury content of the gas,

(e) tapping from the oleum circulating in step (d) only the amount required in step (b) and maintaining the volume of the circulating oleum in step (d) constant by adding thereto sulphuric acid,

(f) using the oleum tapped in step (e) in step (b),

(g) contacting the gas resulting from step (d) with circulating concentrated sulphuric acid, thereby absorbing SO_3 in this concentrated acid,

(h) compensating the concentration increase of the concentrated sulphuric acid circulating in step (g) by adding thereto diluted sulphuric acid or water and tapping therefrom concentrated sulphuric acid, this tapped acid being substantially free of mercury, and

(i) leading acid tapped in step (h) away as product acid.

4,526,769
TRICHLOROSILANE PRODUCTION PROCESS

William M. Ingle; Marilyn S. Peffley, both of Phoenix, and H. S. Nagaraja Setty, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

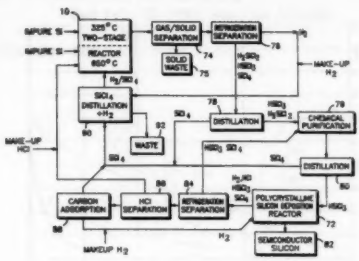
Filed Jul. 18, 1983, Ser. No. 514,424
Int. Cl.³ C01B *33/02*
U.S. Cl. 423—342 **22 Claims**

1. A process for producing $HSiCl_3$ which comprises the steps of:

providing a two stage reactor, the first stage of said reactor maintained at a temperature of about 500°–700° C. and the second stage of said reactor maintained at a temperature of about 300°–350° C.;

charging each of said first and second stages with silicon particles;

flowing a mixture comprising H_2 and $SiCl_4$ through said silicon particles in said first stage and reacting said H_2,



$SiCl_4$, and silicon to cause a partial hydrogenation of said $SiCl_4$;

adding HCl to the effluent from said first stage and passing said effluent and HCl through said silicon particles in said second stage.

4,526,770

METHOD OF PRODUCING CARBON FIBER AND PRODUCT THEREOF

Roger T. Pepper, Scarborough; Daniel C. Nelson, Old Orchard Beach, both of Me., and Douglas S. Lewing, New York, N.Y., assignors to Fiber Materials, Inc., Biddeford, Me.

Continuation-in-part of Ser. No. 193,120, Oct. 2, 1980, abandoned. This application Jun. 4, 1982, Ser. No. 384,881

Int. Cl.³ D01F *9/22*

U.S. Cl. 423—447.4 **14 Claims**

1. In a method of oxidizing fibers of an acrylic polymer comprising recurring acrylonitrile units, wherein said fibers are oxidized in an oxidizing atmosphere heated to a temperature range between about 180° C. to about 300° C. preparatory to carbonization of said fibers, and during oxidation said fibers are drawn under tension, the improvement comprising the steps of

permeating said polymer with a carboxylic acid capable of forming its anhydride when heated to within said temperature range, and

drawing said permeated fibers under tension during oxidation of said fibers in said atmosphere within said temperature range, said carboxylic acid being present initially in said polymer in an amount sufficient to permit improved drawing of the fiber to at least double the original fiber length, and to an average fiber diameter of less than 10 microns.

4,526,771

SULFUROUS ACID GENERATOR

Donald C. Forbush, Logan, and Glen R. Seamon, Wellsville, both of Utah, assignors to International Environmental, Inc., Cody, Wyo.

Continuation-in-part of Ser. No. 261,768, May 8, 1981, abandoned. This application Sep. 27, 1982, Ser. No. 424,417

Int. Cl.³ C01B *17/54, 17/48*

U.S. Cl. 423—543 **30 Claims**

1. Apparatus for burning sulfur with oxygen contained in air comprising:

(a) a primary sulfur-burning chamber comprising (1) an enclosure adapted to have a pool of molten sulfur therein, (2) a sulfur inlet at a first, lower elevation of the enclosure for feed of sulfur into such a pool, (3) an air inlet at a second, relatively higher elevation of the enclosure above the sulfur inlet for introduction of air tangentially into the primary sulfur-burning chamber, and (4) a gas outlet from the enclosure;

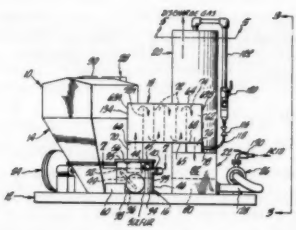
(b) a sulfur feed tank for supplying sulfur to the pool of molten sulfur in the primary chamber, the sulfur feed tank being adapted to receive heat from the primary sulfur-burning chamber for the melting of sulfur in the sulfur feed tank;

(c) a conduit from the sulfur feed tank to the sulfur inlet for transferring sulfur from the sulfur feed tank to the primay sulfur-burning chamber, the cross-sectional area of the conduit being at least 30% of the surface area of the pool;

(d) means for introducing substantially all of the air used for burning the sulfur to the air inlet for burning and vaporizing the sulfur supplied to the pool to form an effluent gas containing sulfur, sulfur dioxide, and oxygen; and

(e) a secondary sulfur-burning chamber having an inlet at a first end thereof and an outlet at a second end thereof, the secondary chamber receiving at its inlet effluent gas containing sulfur, sulfur dioxide, and oxygen discharged from the gas outlet of the primary chamber, the secondary chamber having a tortuous flow path for causing turbulent flow of gas passing therethrough for combustion of substantially all of the sulfur in the effluent gas to sulfur dioxide.

17. A continuous process for producing sulfur dioxide by burning sulfur with oxygen contained in air comprising the steps of:



(a) melting sulfur in a sulfur melting zone;

(b) feeding molten sulfur from the sulfur melting zone into a molten pool of sulfur in a primary sulfur-burning zone at a rate of at least 25 pounds of sulfur per hour per square foot of surface area of the pool, the sulfur being fed to the pool through a conduit, the cross-sectional area of the conduit being at least 30% of the surface area of the pool;

(c) introducing substantially all of the air used for burning the sulfur into the primary zone tangentially under turbulent flow conditions (i) for burning sulfur at the surface of the molten pool with a flame being present, (ii) for vaporizing sulfur from the pool to form an effluent gas stream containing sulfur, sulfur dioxide, and unreacted oxygen, and (iii) for melting sulfur in the sulfur melting zone, the air being introduced at a rate sufficiently high for burning and vaporizing the sulfur fed to the pool and at a rate sufficiently low as to not blow out the flame;

(d) passing the effluent gas stream to a turbulent flow, tortuous flow path secondary sulfur-burning zone for combustion of substantially all of the sulfur in the effluent gas to sulfur dioxide, the effluent gas stream undergoing turbulent flow in the secondary zone; and

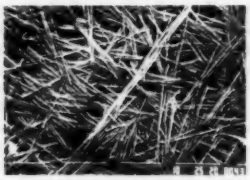
(e) withdrawing gas containing sulfur dioxide from the secondary zone;

wherein substantially all of the heat for melting sulfur in the melting zone is from burning sulfur in the primary and secondary sulfur-burning zone.

4,526,772
BASIC ALUMINUM SULFATE AND PROCESS FOR PRODUCTION THEREOF

Kazuya Takada, Sagamihara; Shigeyuki Toyama, Yokohama, and Yoshihiko Numata, Sagamihara, all of Japan, assignors to Tokuyama Suda Kabushiki Kaisha, Yamaguchi, Japan

Filed May 6, 1982, Ser. No. 375,769
Claims priority, application Japan, May 14, 1981, 56-71399; Nov. 30, 1981, 56-190774; Feb. 12, 1982, 57-19811
Int. Cl.³ C01F *7/74, 7/02*
U.S. Cl. 423—556 **5 Claims**



1. A process for producing fibrous basic aluminum sulfate of the general formula

$$Al(OH)_a(SO_4)_b \cdot nH_2O$$

wherein a, b and n are positive numbers satisfying $a+2b=3$, $2.32 \leqq a < 2.44$, $0.28 < b \leqq 0.34$ and $0 \leqq n \leqq 10$, which comprises adding a water-soluble sulfuric acid salt selected from the group consisting of alkali metal sulfates and ammonium sulfate to a solution of a water-soluble basic aluminum salt of the general formula

$$Al(OH)_cX_d$$

wherein X represents a monovalent anion selected from the group consisting of chloride, nitrate, bromide, iodide, and acetate ions, c and d are positive numbers satisfying $c+d=3$ and c is within the range of from 0.5 to 1.9, at a temperature of less than 50° C. and at such a rate of addition that the time T in hours required for adding the sulfate salt until the mole ratio of SO_4 to Al reaches (3-c)/2 satisfies the expression

$$T < -14c+28.$$

4,526,773
SCRUBBING AND OXIDATION OF HYDROGEN SULFIDE WITH REMOVAL OF DISSOLVED OXYGEN FROM SCRUBBING SOLUTION BEFORE REUSE

Günter Weber, Linden, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 406,804, Aug. 10, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,311
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 3216161
Int. Cl.³ C01B *17/05;* **B01D** *53/34*
U.S. Cl. 423—573 R **21 Claims**

1. In a process for the removal of hydrogen sulfide from a gaseous mixture comprising:

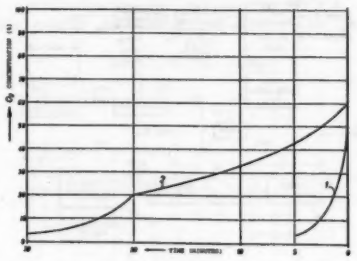
(a) scrubbing said gaseous mixture with an aqueous alkaline scrubbing solution containing an oxidizing agent, whereby the sulfide of the hydrogen sulfide is oxidized principally to elementary sulfur, with the simultaneous reduction of the oxidizing agent to a lower valence state;

(b) regenerating resultant scrubbing solution in a downstream oxidizer comprising introducing an oxygen-containing gas into the scrubbing solution to form dissolved oxygen which reoxidizes the reduced oxidizing agent;

(c) removing elementary sulfur from the scrubbing medium; and

(d) recycling resultant sulfur-diminished and reoxidized scrubbing medium to said scrubbing step (a);

the improvement which comprises conducting step (b) so

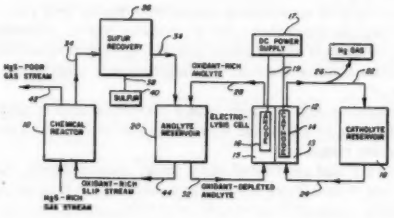


that the reduced oxidizing agent is oxidized to only 60–85% thereof, resulting in residual reduced oxidizing agent, the latter functioning as a scavenger for any oxygen present to substantially prevent the presence of residual dissolved oxygen in the scrubbing solution recycled to the scrubbing step (a).

4,526,774
SEPARATION OF HYDROGEN SULFIDE FROM GASEOUS AND NON-AQUEOUS LIQUID STREAMS

Edward T. Maas, Jr., Batavia, and Davida W. Kalina, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 27, 1984, Ser. No. 604,460
Int. Cl.³ C01B *17/05;* **C25B** *1/00*
U.S. Cl. 423—573 R **6 Claims**



1. A process for converting the H_2S in a gaseous or non-aqueous liquid stream to hydrogen and elemental sulfur comprising feeding to a reaction zone said stream and an anolyte containing I_3^- as an oxidant at a pH of 0 to 1 from a first reservoir to effect the following reaction:

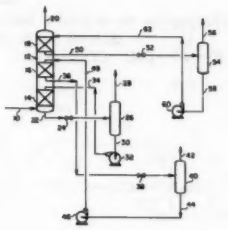
$$I_3^- + H_2S \rightarrow 2H^+ + 3I^- + S$$

removing H_2S-free stream from said reaction zone, removing anolyte-containing solid sulfur from said reaction zone, removing sulfur from anolyte containing same, returning sulfur-free anolyte to said first reservoir, providing an electrolysis cell having a membrane therein to separate said cell into anode and cathode chambers, establishing a voltage across said cell, providing a second reservoir; passing an acid from said second reservoir to said cathode chamber and from said cathode chamber back to said second reservoir, removing hydrogen from said acid returned to said second reservoir, passing an I_3^--depleted stream from said first reservoir to said anode chamber and an I_3^- rich stream from said anode chamber to said first reservoir.

4,526,775
OXYGEN PRODUCTION BY MOLTEN ALKALI METAL SALTS USING MULTIPLE ABSORPTION-DESORPTION CYCLES

Anthony A. Cassano, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 23, 1984, Ser. No. 583,090
Int. Cl.³ C01B *13/00*
U.S. Cl. 423—579 **11 Claims**



1. In a continuous chemical process for separating air into oxygen and nitrogen in which pressurized air is contacted in an absorption zone with an oxygen acceptor which becomes oxidized. the oxidized oxygen acceptor is separately decomposed by pressure reduction and/or supplying heat in a desorption zone to yield an oxygen product and regenerated oxygen acceptor and the regenerated oxygen acceptor is recycled to the absorption zone characterized in that the pressurized air is separated using the oxygen acceptor in a plurality of staged absorption zones in which each staged zone is connected to a separate desorption zone for the recovery of oxygen product and the regeneration of oxygen acceptor.

4,526,776
CATIONIC CYANATO AND THIOCYANATO COMPLEXES USEFUL AS RADIODIAGNOSTIC AGENTS

Vinayakam Subramanyam, Westwood, and Algis Rajeckas, Bedford, both of Mass., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 15, 1983, Ser. No. 485,217
Int. Cl.³ A61K *43/00, 49/00*
U.S. Cl. 424—1.1 **35 Claims**

1. A composition for providing a cationic organic ligand-cyanato-technetium or organic ligand-thiocyanato-technetium complex, said composition comprising (1) a cyanate or thiocyanate ion and (2) a mono- or polydentate organic ligand having one or more donor atoms, each with a free-electron pair available for accepting a proton or for complexing with technetium to form a cationic complex, said organic ligand and said cyanate or thiocyanate ion forming said cationic organic ligand-cyanato-technetium complex or organic ligand-thiocyanato-technetium complex, respectively, when reacted with technetium.

4,526,777
PHARMACEUTICAL COMBINATION COMPOSITION AND ASSOCIATED METHOD

Cheryl D. Blume, and Paul H. Bonner, both of Morgantown, W. Va., assignors to Mylan Pharmaceuticals Inc., Morgantown, W. Va.

Division of Ser. No. 456,311, Jan. 6, 1983, Pat. No. 4,444,769, which is a continuation-in-part of Ser. No. 402,279, Jul. 27, 1982, abandoned. This application Feb. 17, 1984, Ser. No. 581,412
Int. Cl.³ A61K *9/22*
U.S. Cl. 424—20 **11 Claims**

1. A method for enhancing the bioavailability of pharmaceutical combination compositions in solid unit dosage form and composed of at least two solid pharmaceutically-active ingredients of respectively different hydrophilic characteristics, at least one of which is sparingly soluble in physiological fluids, which method consists essentially in

(1) separately providing each of said active ingredients in finely divided particulate solid form;

(2) separately mixing each of said finely divided active ingredients with respective non-toxic pharmaceutically-acceptable inert carrier materials, in finely-divided particulate form,

of the class including wicking agents, surfactants, lubricants, disintegrants and at least one agent functionally capable of aiding in compacting operations

(3) separately compacting said respective active ingredients with said respective carrier materials to form separate compactions thereof

(4) thereafter separately comminuting said separate compactions to form respectively separate granules of said respective active ingredients

each of such respective granules being composed of a large number of said respective individual finely divided active ingredient particles admixed with said finely divided particulate carrier materials

(5) thereafter mechanically blending said respective granules together in desired optimum pharmaceutically effective proportions to form a granularly heterogeneous blended combination and whereby said respective active ingredients particles are substantially retained within said respective granules

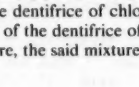
whereafter said thus-blended composition is formulated into unit dosage entities.

4,526,778
STABLE DENTIFRICE CONTAINING NEUTRAL SILICEOUSE POLISHING AGENT

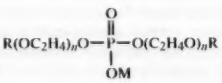
Kenneth Harvey, Wilmslow, and Stephen T. Connors, Sale, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 442,476, Nov. 17, 1982, Pat. No. 4,455,293. This application May 31, 1984, Ser. No. 600,233
Int. Cl.³ A61K *7/16, 7/18*
U.S. Cl. 424—52 **15 Claims**

1. A stable dentifrice contained in an unlined aluminium tube consisting essentially of (a) an aqueous dentally acceptable oral vehicle at least 27.5% by weight of the dentifrice comprising water and dispersed in the said oral vehicle (b) from 10 to 40% by weight of the dentifrice of a neutral sodium aluminosilicate polishing agent containing about 4–5% total aluminium as Al and having a stirred slurry pH in the range from 6.5 to 7.5, (c) a stabilizing amount of monofluorophosphate ion, the dentifrice having a stirred slurry pH in the range from 5.5 to 8, said monofluorophosphate ion stabilizing said dentifrice against gas generating reaction between the components of said dentifrice when said dentifrice is in contact with the surface of said unlined aluminium tube, (d) a non-toxic amount of at least 0.2% by weight of the dentifrice of chloroform and (e) from 0.05 to 5% by weight of the dentifrice of a stabilizing anionic phosphate ester mixture, the said mixture comprising monoester of the formula:



and diester of the formula:



wherein R is an alkyl group of 10 to 20 carbon atoms; n is a

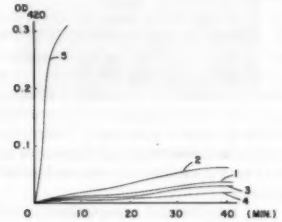
number from 1 to 6; and M is hydrogen, alkali metal or ammonium, said phosphate ester mixture stabilizing said dentifrice containing chloroform when said dentifrice is in said unlined aluminium tube.

4,526,779

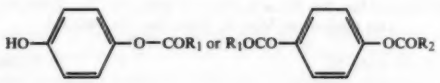
TOPICAL SKIN DEPIGMENTING COMPOSITION

Akira Hashimoto, Takatsuki, Japan, assignor to Sunstar Kabushi Kaisha, Takatsuki, Japan

Filed Feb. 26, 1982, Ser. No. 351,670
Claims priority, application Japan, Mar. 5, 1981, 56-32260
Int. Cl.³ A61K 7/135
U.S. Cl. 424—62 1 Claim



1. A method for depigmentation of skin which comprises topically applying to the skin of a patient requiring depigmentation a cosmetic carrier selected from the group consisting of ointments, creams, lotions, packs and pastes, containing an amount of fatty acid ester of hydroquinone of the formula:



wherein R_1 and R_2 are the same or different, each being a straight or branched, saturated or unsaturated aliphatic hydrocarbon radical having 1 to 20 carbon atoms, effective to depigment the skin.

4,526,780

ANHYDROUS ANTIPERSPIRANT COMPOSITION

Frank W. Marschner, Whitehouse Station; Divaker B. Kenkare, South Plainfield, and James H. Bowers, Somerville, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 241,893, Mar. 9, 1981, abandoned. This application Apr. 25, 1983, Ser. No. 473,163
Int. Cl.³ A61K 7/32, 7/34, 7/38
U.S. Cl. 424—66 10 Claims

1. A stable dry-feel essentially anhydrous cream composition comprising about 10–30% by weight of an antiperspirant and/or deodorant active agent and about 10–50% by weight of an oil absorbent powdered material selected from the group consisting of talc, starches, clay, microcrystalline cellulose, grain flours, and mixtures thereof, homogeneously dispersed in a nonpolar vehicle comprising about 25–55% by weight of a volatile silicone, and about 1–20% by weight of a gelatinized clay in a nonpolar vehicle as suspending/thickening agent selected from the group consisting of bentonite gels, hectorite gels, magnesium aluminum silicate gels, and hydrophobically treated bentonite gels prepared by reacting bentonite in a cation exchange system with an amine.

4,526,781

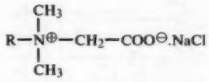
HAIR CARE COMPOSITIONS

Marvin Goldberg, Monsey, and Arthur Brandon, Valley Cottage, both of N.Y., assignors to Revlon, Inc., New York, N.Y.

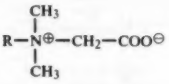
Filed Apr. 25, 1984, Ser. No. 603,864
Int. Cl.³ A61K 7/06, 7/11
U.S. Cl. 424—70 7 Claims

1. A hair shampoo composition comprising by weight:

a. from 0.001% to 5% of hydrogenated tallow betaine of the formula



or



wherein R is hydrogenated tallow alkyl; and about 5% to 25% of at least one anionic surfactant selected from the group consisting of lauryl sulfate, lauryl ether sulfate and the cosmetically acceptable salts thereof and

b. water q.s. to 100%.

4,526,782

PROCESS FOR RECOVERING INTERFERON

Yahiro Uemura, Hirakata; Hirofumi Arimura, Toyonaka; Hiroshi Morise, Hirakata; Satoshi Funakoshi, Katano, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

PCT No. PCT/JP81/00030, § 371 Date Sep. 27, 1982, § 102(e) Date Sep. 27, 1982, PCT Pub. No. WO82/02834, PCT Pub. Date Sep. 2, 1982
PCT Filed Feb. 17, 1981, Ser. No. 432,909
Int. Cl.³ A61K 45/02; C07G 7/00; C12P 21/00
U.S. Cl. 424—85 9 Claims

1. A process for recovering interferon comprising the steps of (1) contacting an aqueous solution containing interferon, which is induced and produced from cells of human origin, with a silicic acid containing adsorbent selected from the group consisting of bentonite, acid clay, kaolin and magnesium silicate thereby absorbing the interferon on the adsorbent, and (2) eluting the adsorbed interferon with a polyoxyethylene group surfactant-containing aqueous solution.

4,526,783

ANTIBIOTIC FROM *S. CLAVULIGERUS*

Martin Cole, Dorking; Thomas T. Howarth, Rudwick, and Christopher Reading, Southwater, all of England, assignors to Beecham Group p.l.c., England

Continuation of Ser. No. 79,062, Sep. 26, 1979, abandoned, which is a division of Ser. No. 964,035, Nov. 27, 1978, abandoned, which is a continuation of Ser. No. 726,480, Sep. 24, 1976, abandoned, which is a division of Ser. No. 569,007, Apr. 17, 1975,. This application Jun. 9, 1981, Ser. No. 272,030
Claims priority, application United Kingdom, Apr. 20, 1974, 17410/74; Jun. 21, 1974, 27715/74; Oct. 9, 1974, 43651/74; Dec. 11, 1974, 53525/74
Int. Cl.³ A61K 35/00
U.S. Cl. 424—114 55 Claims

1. A pharmaceutical composition for treating bacterial infections in humans and animals which comprises a synergistically effective amount of clavulanic acid or a pharmaceutically acceptable salt thereof and an antibacterially effective amount of carbenicillin or a pharmaceutically acceptable salt thereof or the phenyl, tolyl or indanyl ester thereof, in combination with a pharmaceutically acceptable carrier.

4,526,784

AMINO-CYCLITOL DERIVATIVES AND MEDICAMENTS CONTAINING THEM

Fred R. Heiker; Lutz Müller; Walter Puls, and Hilmar Bischoff, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

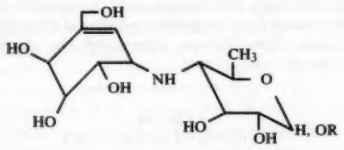
Filed Apr. 19, 1982, Ser. No. 369,761

Claims priority, application Fed. Rep. of Germany, May 5, 1981, 3117705; Aug. 19, 1981, 3132691

Int. Cl.³ A61K *31/73;* C07H *5/06*

U.S. Cl. 514—25 8 Claims

1. A compound which is an aminocyclitol derivative in crystalline form of the formula



in which R denotes C_1–C_{30}-alkyl which may be substituted by 1 to 5 substituents selected from hydroxyl, C_1–C_4-alkoxy, amino, mono- or di-alkylamino having 1 to 4 carbon atoms per alkyl radical, mercapto, C_1–C_4-alkylthio, halogen, C_1–C_4-alkylcarbonyl, carboxyl, nitro, cyano, the aldehyde function and a sulphonic acid group or a C_2–C_6-alkenyl group having 1 to 3 double bonds and optionally carrying 1 to 5 substituents selected from hydroxy, C_2–C_4-alkoxy, mercapto, C_1–C_4-alkylthio, halogen and nitro, and in which the symbol "H, OR" indicates that both possible stereoisomeric formulae are included.

8. A method of treating diabetes, in warm-blooded animals which comprises administering to the animals an active compound according to claim 1 in an amount effective for treating diabetes either alone or in admixture with a diluent or in the form of a medicament.

4,526,785

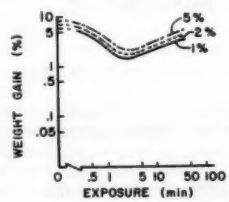
METAL PATTERNS ON PHOTOSENSITIVE GLASSES

Donald M. Trotter, Jr., Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,124

Int. Cl.³ B32B *17/00*

U.S. Cl. 428—209 10 Claims



1. A metal-glass composite comprising a photosensitive glass body with opacifying crystallites selected from the group of lithium silicates, barium silicate, and alkali metal fluorides developed in at least a portion thereof and a deposit of a metal selected from the group of copper, silver, and thallium on and integral with the glass surface coincident with the crystallized portion, said deposit consisting of small individual islands of metal which exhibit electrical conductivity.

4,526,786

N-SUBSTITUTED PHENYL-5-AMINOMETHYL OXAZOLIDINONES AND THEIR METHOD OF USE

Guy R. Bourgery, Colombes; Colette A. Douzon, Paris; Jean-Francois R. Ancher, Rueil-Malmaison; Alain P. Lacour, La Varenne; Patrick G. Guerret, Rueil-Malmaison; Michel Langlois, Buc, and Phillippe L. Dostert, Le Vesinet, all of France, assignors to Delalande S.A., Courbevoie, France

Division of Ser. No. 45,143, Jun. 4, 1979, Pat. No. 4,348,393.

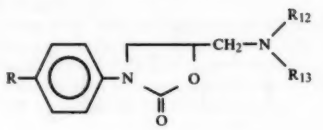
This application Jun. 16, 1982, Ser. No. 388,866

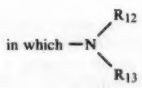
Claims priority, application France, Jun. 9, 1978, 78 17388; Aug. 17, 1978, 78 24024

Int. Cl.³ A61K *31/42, 27/00;* C07D *263/06, 413/06*

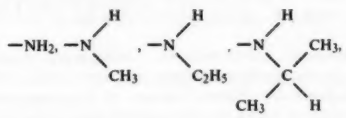
U.S. Cl. 514—240 10 Claims

1. A compound having the formula

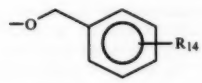




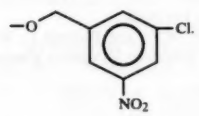
is selected from the group consisting of



and R is selected from the group consisting of cyanomethoxy, 2-cyanoethoxy,



in which R_{14} is H, 3-Cl, 4-F, 3-CN or 3-NO_2, and



4,526,787

N-HETEROCYCLIC RETINOIC ACID ANALOGUES

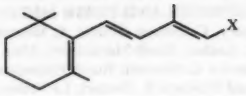
Marcia I. Dawson, Menlo Park; Rebecca L. S. Chan, Palo Alto, and Peter D. Hobbs, Redwood City, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Mar. 28, 1983, Ser. No. 479,182

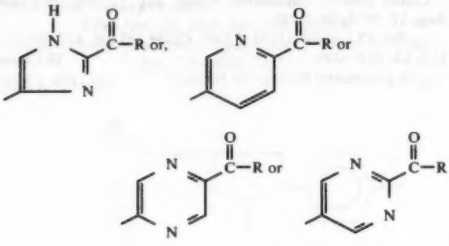
Int. Cl.³ C07D *213/79, 239/54;* A61K *31/505, 31/455*

U.S. Cl. 514—255 18 Claims

1. A compound of the formula:



where X is



and R is hydroxy, alkoxy of 1 to 10 carbon atoms with 0 or 1 hydroxy substituent, phenoxy, monohydroxyphenoxy, monoalkoxyphenoxy where the alkoxy group contains 1 to 4 carbon atoms with 0 or 1 hydroxy substituent, or $—NR^1R^2$ where R^1 is hydrogen, alkyl of 1 to 8 carbon atoms with 0 or 1 hydroxy substituent, phenyl, 4-hydroxyphenyl, or 4-methoxyphenyl, and R^2 is alkyl of 1 to 8 carbon atoms with 0 or 1 hydroxy substituent, phenyl, 4-hydroxyphenyl, or 4-methoxyphenyl.

5. A therapeutic composition for treating a non-malignant skin disorder susceptible to treatment by retinoic acid comprising a therapeutically effective amount of the compound of claim 1, combined with a pharmaceutically acceptable carrier.

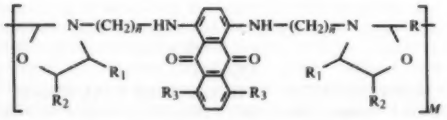
4,526,788

POLYMERIC[[(OXAZOLIDINYL)ALKYL]AMINO]ANTHRAQUINONES

Keith C. Murdock, Pearl River, N.Y., and Richard L. Webb, Darien, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 18, 1983, Ser. No. 476,901
Int. Cl.³ C07D *263/06;* A61K *31/42*
U.S. Cl. 514—374 **7 Claims**

1. A polymer selected from the group consisting of those of the formula:



wherein n is 2, 3 or 4; R_1 is hydrogen or methyl; R_2 is hydrogen or methyl; R_3 is hydrogen or hydroxy; R is $—(CH_2)_p—$ wherein p is zero, 1, 2, 3 or 4, o-phenylene, m-phenylene or p-phenylene; and M is 2–1000; the leuco bases thereof and the tautomers thereof.

4,526,789

PROCESS FOR PREVENTING OR REVERSING CATARACT FORMATION

John I. Clark, Newton; Loretta S. Mengel, and George B. Benedek, both of Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 386,837, Sep. 6, 1982, Pat. No. 4,474,817. This application Sep. 19, 1983, Ser. No. 533,168
Int. Cl.³ A61K *31/11*
U.S. Cl. 514—627 **1 Claim**

1. A process for preventing or reversing cataract formation in the lens of the eye which comprises administering topically to the eye an effective amount of a physiologically acceptable solution of a composition that interacts with constituents of the lens that cause lens opacification, said composition being an aldehyde selected from the group consisting of glutaraldehyde, acetaldehyde, formaldehyde, glyceraldehyde, glyoxal and acrolein and mixtures thereof.

4,526,790

CHEWING GUM PRODUCT

Fred Samala, Clarks Summit, Pa., assignor to Topps Chewing Gum, Incorporated, Brooklyn, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,618
Int. Cl.³ A23G *3/30*
U.S. Cl. 426—5 **10 Claims**

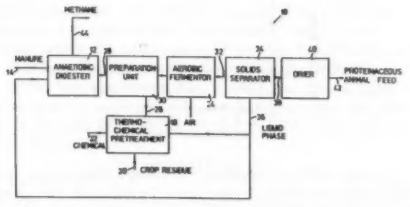
1. An article of manufacture comprising a deformable container having a capped extrusion orifice, said container being filled with a chewing gum composition, said composition being resistant to syneresis over protracted storage periods and being extrudable under ambient temperature conditions, said composition including gum base, sweetener, about 11% or more water by weight, and an activated, thermally reversible solution of a gelling agent, said gel solution being solid at ambient temperatures said gum composition having been introduced into said container at a temperature above the reversal temperature of said gel composition by an extrusion process thereby to introduce laminar flow in said composition in the course of filling said container.

4,526,791

BIOCONVERSION OF AGRICULTURAL WASTES INTO PROTEINACEOUS ANIMAL FEED

Murray M. Young, Waterloo, Canada, assignor to University of Waterloo, Waterloo, Canada

Continuation-in-part of Ser. No. 115,508, Jan. 25, 1980, abandoned. This application Dec. 23, 1982, Ser. No. 452,515
Claims priority, application United Kingdom, Jan. 30, 1979, 7903151
The portion of the term of this patent subsequent to Apr. 12, 2001, has been disclaimed.
Int. Cl.³ C12N *1/24*
U.S. Cl. 426—53 **12 Claims**



1. A process for the formation of proteinaceous material from agricultural waste, which consists of:

(a) anaerobically digesting animal manure to form a gaseous product containing methane and a sludge containing nitrogen and consisting of liquid and solid phases, said anaero-

bic digestion being effected under mesophilic or thermophilic anaerobic fermentation conditions,

(b) pretreating a crop residue in particulated form with a dilute aqueous solution of sodium hydroxide to form a slurry of the pretreated crop residue in solid form and spent sodium hydroxide solution, said pretreatment being effected either:

(i) using an aqueous sodium hydroxide solution at a concentration of about 0.25 to about 1.0% W/W NaOH at a temperature of about 60° to 121° C. for a time of about 120 to about 15 minutes, or

(ii) using an aqueous sodium hydroxide solution at a concentration of about 3 to about 6% W/W NaOH at a temperature of about 15° to about 30° C. while being subjected to gamma radiation at a dosage level of about 10 to about 50 megarads for a time of about 120 to about 60 minutes;

(c) mixing the sludge formed in step (a) with the slurry formed in step (b) without separating any component therefrom to form a fermentation medium having a solids concentration of up to about 30% W/W and containing sufficient nutrient elements to effect fungal fermentation;

(d) sterilizing said fermentation medium and adjusting the pH of the resulting sterile fermentation medium to a value within the range of about 5 to about 7 if not already at a pH value within said range;

(e) inoculating said sterile fermentation medium with a culture of the fungus *Chaetomium cellulolyticum;*

(f) aerobically fermenting said fungus in the sterile inoculated fermentation medium formed in step (e) at a temperature of about 30° to about 40° C. for a time sufficient to provide a fermented solid mass consisting of about 20 to about 100% DM of the fungus and any balance of unfermented crop residue; and

(g) separating said solid mass formed in step (f) from the fermentation medium.

4,526,792

PROCESS OF PRODUCING A COAGULANT COMPOSITION FOR CHEESE PRODUCTION

Georges Granday, and Marcel Jeandot, both of Beaune, France, assignors to S.A. Presure Granday, Beaune, France

Filed Nov. 2, 1982, Ser. No. 438,708

Int. Cl.[3] **A23C** *19/032*

U.S. Cl. 426—56 **8 Claims**

1. A process of producing a coagulating composition adapted for a use in the cheese industry, said process comprising the steps of:

(1) preparing a solution of a non-coagulating proteic material by steeping calves reeds pieces in a solution containing substantially about 84% water, about 15% sodium chloride, and about 1% sodium benzoate for a period of time sufficient to produce a solution containing non-coagulating proteic material;

(2) filtering the solution resulting from step (1) and removing the milk-coagulating portion therefrom to form a solution of non-coagulating proteic material devoid of milk coagulating enzymes; and

(3) suspending a slurry of at least one coagulating enzyme extracted from a microbial or fungal strain in the solution of non-coagulating proteic material resulting from step (2), thereby producing said coagulating composition.

4,526,793

LIPID COMPOSITION FOR ORAL, ENTERAL OR PARENTERAL NUTRITION

Yves Ingenbleek, Corseaux; Helmut Traitler, Vevey, both of Switzerland, and Jean-Yves Wessely, Bois-Colombes, France, assignors to Nestec, S.A., Vevey, Switzerland

Filed Apr. 6, 1983, Ser. No. 482,430

Claims priority, application Switzerland, Apr. 16, 1982, 2314/82

Int. Cl.[3] **A23D** *5/00;* **A23L** *1/30*

U.S. Cl. 426—72 **10 Claims**

1. A nutritional lipid composition comprising:

(a) from 10 to 30% by weight of an oil containing γ-linolenic acid in the form of triglycerides, said oil being obtained from the pips or seeds of fruits of the genus Ribes,

(b) from 20 to 40% by weight of triglycerides of C_6–C_{12} fatty acids, and

(c) from 50 to 70% by weight of an edible oil containing fatty acids in the form of triglycerides, at least 80% of the number of the fatty acids present being C_{12} to C_{18} fatty acids, the total of components (a) and (b) not exceeding 50% by weight of the composition.

4,526,794

CITRUS ALBEDO BULKING AGENT AND PROCESS THEREFOR

Robert E. Altomare, Yonkers; Robert J. Beale, New Rochelle; Martin Glicksman, Valley Cottage; Elizabeth Hegedus, Tarrytown, all of N.Y.; Marvin Schulman, Howell, and Jerry E. Silverman, Hamilton Square, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,408

Int. Cl.[3] **A23L** *1/277, 1/34, 1/04*

U.S. Cl. 426—258 **19 Claims**

1. A process for producing a citrus albedo bulking agent which comprises:

(a) shaving a citrus peel to obtain albedo particles which are substantially free of flavedo;

(b) washing the albedo particles with water prior to autolysis and/or fermentation occurring therein to remove at least 75% of soluble carbohydrates;

(c) contacting the water-washed albedo particles with an alcoholic solution to deflavorize and decolorize the albedo and remove additional carbohydrates;

(d) removing the water and alcohol from said albedo particles to produce a bland, decolorized citrus albedo bulking agent; and

(e) comminuting the dried citrus albedo bulking agent.

4,526,795

METHOD FOR PRODUCING CROISSANTS

Andrew Wolf, Deerfield, Ill., assignor to Kitchens of Sara Lee, Inc., Deerfield, Ill.

Filed Feb. 9, 1984, Ser. No. 578,755

Int. Cl.[3] **A21D** *13/00, 8/02*

U.S. Cl. 426—297 **7 Claims**

6. The method of producing a filled food product comprising the steps of advancing a dough sheet along a predetermined path, longitudinally severing the continuously advancing dough sheet to define two dough ribbons, each ribbon having an elongated relatively straight edge and an elongated generally serrated edge continuously extruding a ribbon of filler material upon selected areas of each continuously advancing dough ribbon, individually curling the advancing dough ribbons upon themselves to define elongated, spaced, generally parallel, longitudinally extending generally cylindrical dough configurations having filler material therein, applying pressure to selected, spaced areas of the continuously advancing cylindrical dough configurations to push the filling material away from the selected, spaced areas, severing transversly the continuously advancing cylindrical dough configurations at se-

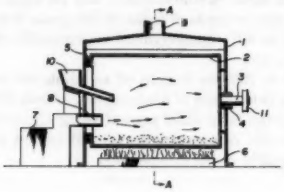
lected spaced areas corresponding to the areas where pressure was applied to form discrete articles.

4,526,796

HEAT-TREATED TEA AND METHOD FOR PREPARING THE SAME

Keitaro Ashikawa, 408, Ishikawa, Numazu-shi, Shizuoka-ken, Japan

Filed Mar. 21, 1983, Ser. No. 477,137
Claims priority, application Japan, Mar. 29, 1982, 57-48838
Int. Cl.³ A23B *4/04*; F26B *11/02*
U.S. Cl. 426—465 **7 Claims**



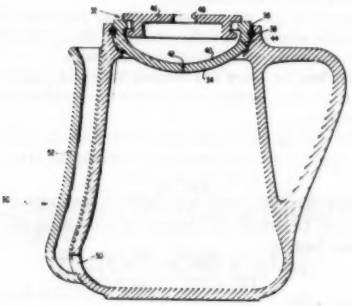
1. Heat treated tea produced by placing green tea leaves in a tea drier, supplying the drier with dry air externally heated to 200° and 300° C. and concurrently heating the drier from the outside of the drier at a temperature sufficient to heat the green tea leaves to 200° to 300° C. for 20 to 60 minutes.

4,526,797

DECANTER FOR REDUCING OXIDATION AND EVAPORATION OF COFFEE

Wayne B. Stone, Jr., Bethesda, Md., assignor to Wood Manufacturing Co., Inc., Flippin, Ark.

Division of Ser. No. 233,505, Feb. 11, 1981, Pat. No. 4,419,927. This application Nov. 22, 1982, Ser. No. 443,803
Int. Cl.³ A23F *5/24*; A47G *19/14*
U.S. Cl. 426—520 **4 Claims**



1. The method of reducing oxidation and evaporation of coffee having a generally accepted drinking temperature of approximately 160° F.–180° F. from a decanter of the type having a pour spout opening into the decanter at the lower level thereof and providing a liquid seal as to an appreciable volume of coffee within the decanter, the decanter including an open mouth through which coffee may be introduced into the decanter and a removable top for sealably covering the mouth thereof, which consists of heating the decanter to maintain coffee therein at a generally accepted drinking temperature of approximately 160° F.–180° F., establishing a low thermal conductivity proration of decanter height and wall thickness to provide a temperature differential such that the upper level of coffee within the decanter is cooler than the coffee within the lower level of the decanter from which the coffee is poured, and providing a vent opening in the top whereby to facilitate pouring coffee from the decanter through the pour spout thereof, and in which the cumulative area of the vent opening is such that the vapor pressure of an appreciable amount of heated coffee within the decanter exceeds atmospheric pressure to substantially create a vapor seal across the vent opening when coffee is not being poured from the decanter.

4,526,798

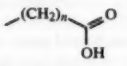
MIXTURES OF ONE OR MORE C_4–C_{10}-N-ALKANOIC ACIDS WITH THE ETHYL ESTER OF 2-HYDROXY-4-METHYL PENTANOIC ACID

Domenick Luccarelli, Jr., Neptune; Braja D. Mookherjee, Holmdel; Richard A. Wilson, Westfield; Michael J. Zampino, North Bergen, and David R. Bowen, Somerset, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 620,164, Jun. 13, 1984, Pat. No. 4,499,114. This application Sep. 14, 1984, Ser. No. 650,716
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.³ A23L *1/235*
U.S. Cl. 426—534 **1 Claim**

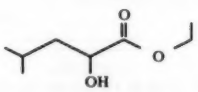
1. A mixture consisting of:

(a) at least one carboxylic acid defined according to the structure:



wherein n represents an even integer of 2, 4, 6 or 8; and

(b) the synthetically produced substantially pure ethyl ester of 2-hydroxy-4-methyl pentanoic acid having the structure



wherein the weight ratio of ethyl ester of 2-hydroxy-4-methyl pentanoic acid:carboxylic acid is from about 8:1 down to about 2:1.

4,526,799

PROCESS FOR PREPARING A HIGH QUALITY, REDUCED-CALORIE CAKE

Martin Glicksman, Valley Cottage; John R. Frost, Beacon, both of N.Y.; Jerry E. Silverman, Hamilton Square, N.J., and Elizabeth Hegedus, Tarrytown, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 355,405, Mar. 8, 1982,. This application Mar. 12, 1984, Ser. No. 588,631
The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.
Int. Cl.³ A21D *13/08*
U.S. Cl. 426—553 **8 Claims**

1. A process for producing a low-calorie cake which comprises:

combining from 0.6 to 2.5 parts by weight water with a dry cake mix, said dry cake mix comprising 10 to 50% cake flour by weight, dry basis; 0 to 45% sugar; 2 to 12% shortening; 0 to 20% egg white solids; 1 to 12% leavening agent; 0 to 4% emulsifier; 1 to 20% of a bulking agent selected from the group consisting of citrus albedo, sugar beet pulp, pineapple core, and combinations thereof; and 0 to 10% gum;

throughly mixing the combination until it is smooth and uniform; and

baking the combination at a temperature within the range of from 300° F. to 450° F. from 10 minutes to 60 minutes to produce a bake loss within the range of 5 to 20%.

4,526,800
CEREAL SNACKFOODS AND COMPOSITIONS AND METHODS FOR MAKING THE SAME

Alan N. Howard, 39 Gilmerton Crt., Long Rd., Trumpington, Cambridge CB2 2HQ, England

Continuation-in-part of Ser. No. 257,320, Apr. 24, 1981, abandoned. This application Apr. 17, 1984, Ser. No. 600,559

Claims priority, application United Kingdom, Apr. 26, 1980, 8013858

Int. Cl.³ A23L *1/10*

U.S. Cl. 426—559 **10 Claims**

1. An expanded snackfood prepared from a dough composition of predetermined volume and comprising cooked portions of dough composition comprising gelatinized starch and added, heat-treated cereal bran having amylase therein destroyed, said bran being selected from the group consisting of wheat bran, barley bran, oat bran, rye bran, maize bran and mixtures thereof, the snackfood containing from about 5% to about 35% by weight of oil or fat and from about 15% to about 70% by weight of bran, and having a volume at least about 1.25 times said predetermined volume.

4,526,801
REFRIGERATED DOUGH

William A. Atwell, Spring Lake Park, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Aug. 1, 1983, Ser. No. 518,892

Int. Cl.³ A21D *2/00*

U.S. Cl. 426—128 **18 Claims**

1. A fresh dough product contained in a container and being at least partially chemically leavened, said dough product including wheat flour, water, and chemical leaveners in amounts adequate to form a dough adapted for making bread like items, said dough product including:

a volatilizable edible substance having a vaporization temperature of less than about 200° F. in an amount sufficient to produce at least about 6.5×10^{-5} moles of gas per gram of dough, in the container based on a 15% gas retention value, and said dough having a packed specific volume in the container above about 1.25 cc/gm.

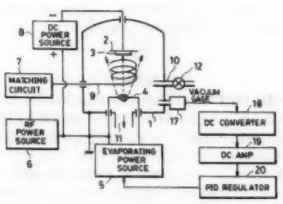
4,526,802
FILM DEPOSITION EQUIPMENT

Kazuo Sato, Tokyo, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1983, Ser. No. 481,004

Int. Cl.³ C23C *13/00*

U.S. Cl. 427—8 **1 Claim**



1. In a process for depositing a film on a substrate by a vacuum deposition method, which comprises placing a substrate in a vacuum chamber, supplying reactive gas to the chamber, evacuating the chamber and setting a predetermined value of decrease in pressure therein, evaporating a metal in the chamber for reaction with the reactive gas whereby to deposit a film of the reaction product thereof on the substrate, the evaporation of said metal being effective to decrease the pressure in said vacuum chamber, the improvement which comprises: detecting the decrease in the pressure within said vacuum chamber caused by absorption of the reactive gas by the metal vapor, comparing the value of the detected decrease with said predetermined value to generate a detection signal in response to that decrease; and controlling the operation of said metal evaporating means in response to said detection signal to maintain said decrease at said predetermined value whereby to cause the rate at which the film is deposited on the substrate to remain substantially constant.

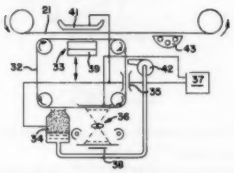
4,526,803
TRANSPARENTIZING

Leonard A. White, Gurnee, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 20, 1983, Ser. No. 506,033

Int. Cl.³ B05D *1/04;* **B05B** *5/00*

U.S. Cl. 427—14.1 **11 Claims**



1. A method for electrostatically transparentizing a portion of a substrate, comprising:

selecting finely divided, electrostatically chargeable particles of a material having transparentizing characteristics for a preselected substrate;

electrostatically depositing said finely divided transparentizing particles onto a predetermined area of the substrate;

heating the transparentizing particles to form a molten transparentizing material at the predetermined area; and

transparentizing the substrate at the predetermined area by flowing the molten transparentizing material into the substrate at the predetermined area and allowing the material to solidify therein to form a substrate having a transparentized area and an opaque area.

4,526,804
METHOD FOR PROVIDING SHEET METAL STOCK WITH FINELY DIVIDED POWDER

Eduardo C. Escallon, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Continuation-in-part of Ser. No. 412,635, Aug. 30, 1982, abandoned. This application Mar. 22, 1983, Ser. No. 477,786

Int. Cl.³ B05D *1/04, 1/06*

U.S. Cl. 427—32 **26 Claims**

15. A method of providing metal stock with a uniform distribution of very finely divided particles of resinous powder, comprising:

providing a supply of resinous powder particles adjacent a coating zone;

releasing a gentle flow of gas through the supply of powder particles to permit the particles to flow freely and be redistributed to assume an unpacked state;

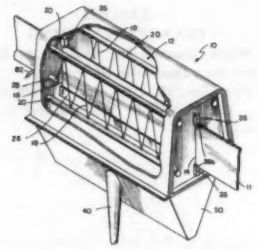
delivering a substantially uniform flow of said unpacked powder particles to a comminuting site;

releasing the fluid energy of a compressed gas to the flow of particles to impart sufficient momentum to said powder particles in the comminuting zone to reduce their average particle size to a very finely divided particle size of 10 microns or less;

directly diffusing the thus-formed finely divided particles and gas to cause a loss of momentum immediately after

being released to provide a substantially quiescent, slowly and upwardly moving gas stream to maintain the very finely divided particles segregated in a uniform cloud and to carry said cloud to the coating zone, said upwardly moving gas stream and cloud being directed to the coating zone over a path free of restriction that may concentrate the cloud and agglomerate the particles;

confining said cloud of very finely divided particles in the coating zone, said very finely divided particles having a diameter-to-weight ratio such that they will remain suspended in the substantially quiescent atmosphere of the coating zone;



moving sheet metal stock to be coated in strip form through the coating zone;

providing an electric charging and depositing field terminating on the metal stock strip in the coating zone having a potential gradient sufficient to charge the finely divided particles and deposit said finely divided particles on the metal surface while the particles are in a repelling relationship with respect to one another thereby providing a uniform distribution of said finely divided particles on the strip; and

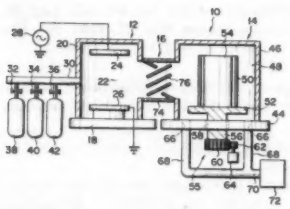
coalescing the finely divided particles to form a uniform coating of about 0.5 mil in thickness.

4,526,805

FILM-FABRICATING METHOD AND APPARATUS FOR THE SAME

Shuji Yoshizawa, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 12, 1983, Ser. No. 541,308
Claims priority, application Japan, Oct. 13, 1982, 57-179305
Int. Cl.³ B05D *3/06*; C23C *12/08*
U.S. Cl. 427—38 **23 Claims**



1. A film-fabricating method comprising steps of decomposing a raw gas to generate activated molecular species, reacting the produced activated molecular species, and depositing a thin film of the reacted molecular species on a substrate held in a film-forming chamber, wherein the raw gas is decomposed to produce activated molecular species in a reaction chamber which is separate from the film-forming chamber; and wherein the produced activated molecular species are taken into the film-forming chamber from the reaction chamber through communication means while light beams emitted during decomposition of the raw gas in the reaction chamber are prevented from entering the film-forming chamber through the communication means.

6. A film-fabricating apparatus for depositing a film onto a substrate which comprises:

a reaction chamber including decomposition means for decomposing a raw gas to produce activated molecular species;

a film-forming chamber to contain the substrate on which the film is deposited;

communication means establishing communication between the reaction chamber and film-forming chamber for conducting the activated molecular species produced in the reaction chamber to the film-forming chamber and for preventing light beams emitted during the decomposition of the raw gas from entering into the film-forming chamber;

supply means which is connected to the reaction chamber, for supplying the raw gas to said reaction chamber; and

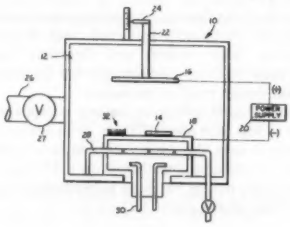
decompression means which is connected to the film-forming chamber, for decompressing the interior of said film-forming forming chamber.

4,526,806

ONE-STEP PLASMA TREATMENT OF COPPER FOILS TO INCREASE THEIR LAMINATE ADHESION

Reza Haque, Hamden; Edward F. Smith, III, Madison, and Igor V. Kadija, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 22, 1983, Ser. No. 554,465
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—41 **22 Claims**



1. A process for depositing an adherent polymeric film on at least one surface of a copper or copper alloy substrate, said process comprising:

forming a plasma of a polar containing organic species and at least one of nitrogen and hydrogen; and

exposing said copper or copper alloy substrate to said plasma for a period of time sufficient to deposit said polymeric film on said at least one surface.

4,526,807

METHOD FOR DEPOSITION OF ELEMENTAL METALS AND METALLOIDS ON SUBSTRATES

Abraham Auerbach, Albany, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 27, 1984, Ser. No. 604,661
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—53.1 **7 Claims**

1. A method of depositing conductive elemental metal or metalloid lines or spots on a non-conductive substrate which comprises the steps of preparing a solution or dispersion of at least one reducible metal or metalloid compound in an oxidizable organic matrix comprising a polyamic acid or polyimide prepared by the reaction of at least one aromatic diamine with

2,2-bis propane dianhydride, coating said substrate with said solution or dispersion, and contacting said coated substrate with a beam of localized radiation absorbable by said coated substrate, thereby causing reduction of said metal or metalloid to the elemental state by said matrix.

4,526,808

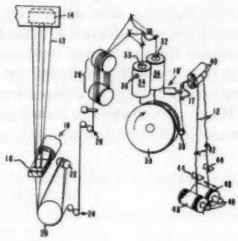
METHOD FOR APPLYING LIQUID TO A YARN

Alfred J. Strohmaier, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 55,062, Jul. 5, 1979, abandoned. This application Jun. 2, 1981, Ser. No. 269,529

Int. Cl.³ B05D *1/02*

U.S. Cl. 427—57 **19 Claims**



1. A method for applying a liquid to a threadline comprising: supplying liquid in a metered stream to an atomizing surface of a passage through the tip of a horn of an ultrasonic vibrator; vibrating said horn to atomize said liquid and produce a mist; and moving said threadline in a path through said passage in such close proximity to said atomizing surface that said mist is propelled onto said threadline.

4,526,809

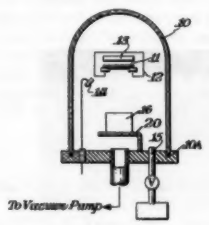
PROCESS AND APPARATUS FOR FORMATION OF PHOTOVOLTAIC COMPOUNDS

Robert B. Hall, Newark, and Richard E. Rocheleau, Wilmington, both of Del., assignors to University of Delaware, Newark, Del.

Filed Oct. 19, 1983, Ser. No. 543,548

Int. Cl.³ H01L *29/22*

U.S. Cl. 427—74 **7 Claims**



1. In a process for forming a semiconductor material of a preselected composition comprising three elements, said three elements capable of having a first element from group II in a variable proportion to a second element from group II and a third element from group VI in a proportion equal to the sum of the first element and the second element, said composition formed by heating to evaporate said elements to form a vapor flux of each element in a vacuum, conducting the vapor flux of each of the said three to a heated substrate to combine and form the semiconductor material thereon, the improvement comprising:

controlling the flux of the first element and the second element at a value corresponding to the proportion of the respective elements in the preselected composition; and

controlling the flux of the third element to at least twice the sum of the fluxes of the first and the second elements whereby to produce the composition with the preselected proportion of the first to the second element and the proportion of the third element equal to the sum of the first and second elements.

4,526,810

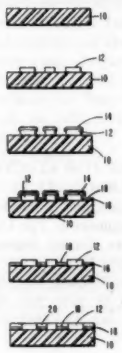
PROCESS FOR IMPROVED WALL DEFINITION OF AN ADDITIVE PRINTED CIRCUIT

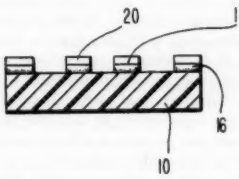
Raymond A. Nesbitt, Henrico County, Va., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Jun. 17, 1982, Ser. No. 373,194

Int. Cl.³ B05D *3/10, 5/12*

U.S. Cl. 427—98 **12 Claims**





1. A process of forming a metal pattern on an insulating substrate comprising the steps of:

(a) forming a mask over at least one major surface of the substrate to define a raised negative mask pattern of the desired metal pattern;

(b) applying a coating over the mask, the coating material covering only the mask and not the adjacent exposed substrate areas, said coating being strippable by a chemical treatment which does not substantially attack the underlying mask;

(c) depositing a species catalytic to electroless plating on the exposed substrate surface;

(d) chemically stripping the coating material and any overlying deposit while leaving the underlying mask intact; and

(e) plating a metal to a desired thickness to form the desired metal pattern on the substrate including at least a first plating step comprising electroless plating.

4,526,811

METHOD AND COMPOSITION FOR REPAIRING REAR WINDOW DEFOGGERS

Gary L. Jialanella, Maple Heights, Ohio, assignor to Loctite Corporation, Newington, Conn.

Filed Oct. 27, 1983, Ser. No. 545,900
Int. Cl.[3] B05D 5/12
U.S. Cl. 427—108 8 Claims

1. A method of repairing a rear window defogger comprised of a series of parallel spaced apart conductor lines fixed to the inside surface of a rear window, one or more of the lines being electrically interrupted and consequently inoperative, said method comprising the steps of cleaning the area of the rear window in the vicinity of the interrupted section of a line, applying a repair composition to the area in the vicinity of the interrupted portion of the line to bridge the interruption, the repair composition being a dispersion of an electrically conductive material in a volatile solvent solution of an acrylic ester polymer having a T_g such that said composition does not lose its structural integrity upon heating of said lines to a temperature of up to about 100° C., and then evaporating the solvent to establish an electrically conductive path across the interrupted section of the lines.

4,526,812

COATED POWDER FOR ELECTROLYTE MATRIX FOR CARBONATE FUEL CELL

Charles D. Iacovangelo, and Kenneth W. Browall, both of Schenectady, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 489,431, Apr. 29, 1983,. This application Nov. 28, 1983, Ser. No. 555,743
Int. Cl.[3] H01M 8/00
U.S. Cl. 427—115 4 Claims

1. A process for producing a porous electrolyte tape for holding electrolyte in a molten carbonate fuel cell comprising providing electrolyte carbonate-coated ceramic particles wherein the carbonate ranges from about 5% by volume to about 30% by volume of said coated ceramic particles and wherein no significant portion of said ceramic particle is exposed, said electrolyte carbonate coating consisting of a carbonate useful as an electrolyte in a molten carbonate fuel cell, said ceramic particles ranging in diameter from about 0.1 micron to about 5 microns, said carbonate-coated ceramic particle not differing significantly in diameter from said ceramic particle, said ceramic particles not being significantly deleteriously effected by said molten carbonate fuel cell, admixing said coated ceramic particles with an organic binding agent, said binding agent being a solid at room temperature but fluid at elevated temperature and heat-decomposable below 400° C. vaporizing away leaving no significant residue, said binding agent being used in an amount sufficient to bind said coated particles together to produce a self-supporting tape from which said binding agent can be vaporized away leaving no significant residue and leaving said porous electrolyte tape, shaping said mixture into said binding agent-containing tape, and heating said binding agent-containing tape to decompose and vaporize away said binding agent producing said porous electrolyte tape, said porous electrolyte tape consisting essentially of said electrolyte carbonate-coated particles, said tape being less than 760 microns in thickness but having a thickness substantially greater than the diameter of the ceramic particles and that thickness encompassing a plurality of particles with a porosity ranging from about 30% by volume to about 65% by volume of the total volume of said tape and a pore size ranging from about 0.2 micron to about 2 microns.

4,526,813

COMPOSITION AND METHOD FOR CORROSION INHIBITION

Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 369,293, Apr. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 181,913, Aug. 27, 1980, abandoned. This application Feb. 9, 1983, Ser. No. 465,077
Int. Cl.[3] B05D 7/22, 1/18
U.S. Cl. 427—235 15 Claims

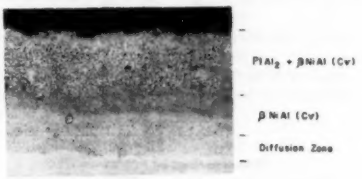
1. A method for treating metal surfaces of drilling equipment in a well for the recovery of natural fluids from a subterranean reservoir, the method comprising injecting a composition comprising an epoxy resin, an N-tallow-1,3-diaminopropane curing agent for the epoxy resin present in an amount such that the equivalent ratio of the curing agent to the epoxy resin is from about 1.5:1 to about 5:1, an aromatic hydrocarbon diluent present in at least an amount sufficient to maintain the composition in an essentially fluid state, and methanol present in an amount of about 10 to about 60 weight percent of the composition into the well and allowing the composition to contact the metal surfaces for a time sufficient to form a corrosion-inhibiting film thereon.

4,526,814

METHODS OF FORMING A PROTECTIVE DIFFUSION LAYER ON NICKEL, COBALT, AND IRON BASE ALLOYS

Srinivasan Shankar, Branford, and G. William Goward, New Haven, both of Conn., assignors to Turbine Components Corporation, Branford, Conn.

Filed Nov. 19, 1982, Ser. No. 443,036
Int. Cl.[3] C23C 11/00
U.S. Cl. 427—253 29 Claims



500 x

1. A method for forming a protective diffusion layer of chromium, platinum group metal and aluminum on nickel, cobalt and iron base alloy parts comprising the steps of depositing a coating of a platinum group metal on the surface of the part to be protected, forming a diffusion layer of platinum group metal and chromium on said surfaces by gas phase chromizing said surfaces out of contact with a source of gaseous chromizing species at elevated temperature, and forming a diffusion layer of platinum group metal, chromium and aluminum on said surfaces by aluminizing said surfaces at elevated temperature.

4,526,815

FLOOR POLISHES PARTICULARLY RECEPTIVE TO HIGH SPEED AND VERY HIGH SPEED SPRAY OR DRY BUFFING

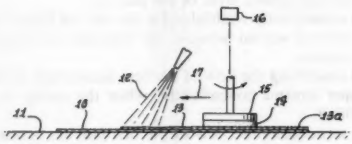
Walter J. Hackett, Westminster, and Peter E. Galena, Huntington Beach, both of Calif., assignors to TP Industrial, Inc., Lakewood, Calif.

Continuation-in-part of Ser. No. 319,634, Nov. 9, 1981, Pat. No. 4,414,360, which is a division of Ser. No. 253,300, Apr. 13, 1981, Pat. No. 4,363,835. This application Nov. 4, 1983, Ser. No. 548,629

The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.

Int. Cl.[3] B05D *3/02, 3/12*

U.S. Cl. 427—355 17 Claims



1. The method of producing a toughened, mar-resistant floor film comprising the steps:

(a) applying to the floor surface a polish containing a cross-linking agent selected from the group that consists essentially of methylated melamine and sodium benzoate, and

(b) dry buffing said surface to heat said polish and surface and produce cross-linking of said agent within the film and with said surface.

4,526,816

FATTY ACID EMULSION AND COATING OF GLASSWARE THEREWITH

Gerald P. Misczyk, DuBois, Pa., assignor to Brockway, Inc., (NY), Brockway, Pa.

Continuation-in-part of Ser. No. 337,709, Jan. 7, 1982, abandoned. This application Feb. 28, 1984, Ser. No. 584,342

Int. Cl.[3] B05D *1/36, 7/00*

U.S. Cl. 427—417 6 Claims

1. A method for coating a glass article comprising formulating a pourable stable emulsion consisting essentially of an unsaturated fatty acid containing 14 to 22 carbon atoms and an alkali metal salt thereof, by adding the fatty acid to an aqueous solution containing an alkali metal hydroxide in an amount sufficient to react with from about 33% to about 50% by weight of the said acid and to thereby form the alkali metal salt of said acid, then stirring the mixture until the reaction is complete and emulsification occurs, and then spraying the emulsion in diluted form onto the glass article wherein the glass temperature of the article is in the range of from about 140° to about 200° F.

4,526,817

PROCESS FOR SURFACE DIFFUSING STEEL PRODUCTS IN COIL FORM

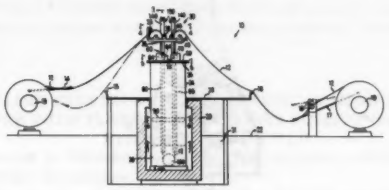
John J. Rausch, 18715 W. Edward Rd., Antioch, Ill. 60002, and Russell F. Novy, Northbrook, Ill., assignors to Material Sciences Corporation, Elk Grove Village; Ray J. Van Thyne, Inverness and John J. Rausch, Gurnee, all of, Ill.

Continuation-in-part of Ser. No. 438,161, Nov. 1, 1982, abandoned. This application Oct. 4, 1983, Ser. No. 538,789

Int. Cl.[3] C23C *1/00*

U.S. Cl. 427—431 10 Claims

1. A continuous process of surface diffusion alloying a continuous length of steel product supplied in a coil, comprising uncoiling the steel product, preheating the steel product, providing a molten-alloy bath having therein lead and chromium and titanium, said molten-alloy bath having titanium of a concentration in the range of about 67 ppm to about 367 ppm, lead being the only transfer agent in the bath, moving the steel product continuously through the bath for diffusing the chromium into the surface of the steel product, and cooling the diffused steel product.



4,526,818

LIQUID CRYSTAL DISPLAY PANEL AND PROCESS FOR THE PRODUCTION THEREOF

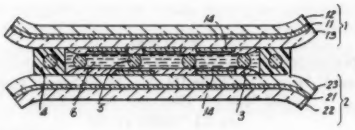
Jun Hoshikawa; Yukihiro Iwashita, and Osamu Suzuawa, all of Shiojiri, Japan, assignors to Epson Corporation, Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,457

Claims priority, application Japan, Dec. 23, 1982, 57-228182; Apr. 14, 1983, 58-65961; Apr. 14, 1983, 58-65965; Apr. 14, 1983, 58-65969; Apr. 14, 1983, 58-65970

Int. Cl.[3] C09K *3/34*

U.S. Cl. 428—1 24 Claims



1. A liquid crystal display panel having uniform cell thickness, comprising:

a first substrate and a second opposed substrate, each said substrate having cooperating electrode means selectively disposed on the interior surfaces thereof,

at least one of the substrates being a laminate of two flexible plastic films and a polarizing film therebetween, the two plastic films having different thermal expansion coefficients, the thermal expansion coefficient of the film on the interior surface being less than the thermal expansion coefficient on the opposed surface so that the center of the substrate is biased convexly towards the opposed substrate,

substantially rigid spacer means disposed between said substrates; and

adhesive means disposed about the periphery of the substrates for coupling the substrates and maintaining the display panel assembled, said at least one substrate being a laminate biased against the spacer means for maintaining uniform thickness across the display panel.

4,526,819

CHRISTMAS TREE DECORATION

Robert W. Murray, 969 Esquimalt Ave., West Vancouver, B.C., Canada (V7T 1J9)

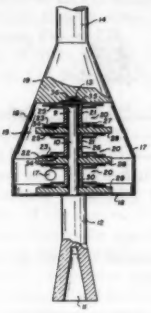
Filed Jun. 7, 1983, Ser. No. 502,012

Int. Cl.[3] A47G *33/08*

U.S. Cl. 428—7 15 Claims

3. A decoration for a tree comprising:

(a) a shaft having a lower end adapted to attach to the top of the tree;



(b) a storage unit having a pulley mounted about said shaft; and

(c) a garland attached to the pulley of said storage unit.

4,526,820

ORNAMENTAL MARKER FOR VEHICLE ANTENNAS

Michael F. Haas, 3150 Palm Dr., No. 48, Fullerton, Calif. 92631

Filed May 31, 1984, Ser. No. 615,829

Int. Cl.[3] **B60R** *13/00*

U.S. Cl. 428—31 **11 Claims**

1. In combination, an ornament and identification device for vehicles, wherein the ornament is adapted to be secured to a radio antenna of said vehicle, said combination comprising:

a first marker member having a predetermined configuration;

a second marker member having a configuration for matching engagement with said first marker member;

wherein each of said marker members includes an outer surface and an inner surface;

an elongated channel centrally positioned in said inner surface of each marker member, wherein said antenna is secured within said channels when said marker members are fixedly engaged with each other about said antenna; and

means provided on at least one inner surface for fixedly securing said ornament to said antenna.

4,526,821

MULTI-LAYER CONTAINER AND METHOD OF MAKING SAME

Robert J. McHenry, St. Charles, and Robert Seebohm, Barrington, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Jul. 20, 1979, Ser. No. 59,374

Int. Cl.[3] **B29C** *17/07;* **B29D** *9/04;* **B29F** *1/06;* **B32B** *1/02*

U.S. Cl. 428—35 **47 Claims**

1. A method of making a multi-layer rigid article comprising the steps of:

(A) injection molding from a nozzle having an exit a parison in an injection mold cavity, by:

(1) establishing in the exit the flow of a first polymer stream to become the inside surface layer of the parison and the flow of a second polymer stream to become the outside surface layer of the parison,

(2) subsequently establishing in the exit the flow of a third polymer stream between the first and second polymer streams,

(3) continuing the flow of the first, second and third polymer streams concurrently, when the cavity is nearly filled,

(4) terminating the flow of the first polymer stream,

(5) subsequently terminating the flow of the third polymer stream, and then

(6) subsequently terminating the flow of the second polymer stream,

(B) transferring the injection molded parison to a blow molding cavity having the configuration of the article, and

(C) inflating the parison in the blow molding cavity to form the article.

34. An injection blow molded multi-layer rigid plastic container having a continuous core layer which is sufficiently impermeable to oxygen as to protect food products from oxidative degradation and which is completely encapsulated within outer layers.

46. An injection molded multi-layer plastic parison for a blow molded container, said parison having a continuous core layer which is sufficiently impermeable to oxygen as to protect food products from oxidative degradation and which is completely encapsulated within outer layers.

4,526,822

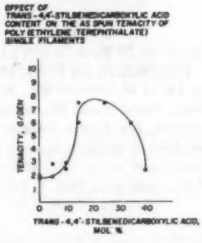
SHAPED ARTICLES FROM POLY(ETHYLENE TEREPHTHALATE) MODIFIED WITH TRANS-4,4'-STILBENEDICARBOXYLIC ACID

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 429,897, Sep. 30, 1982,. This application Nov. 14, 1983, Ser. No. 551,394

Int. Cl.[3] **B65D** *00/00;* **B32B** *7/02;* **C08G** *63/54*

U.S. Cl. 428—35 **6 Claims**



1. Oriented shaped article formed from a copolyester containing repeating units from less than 90 to about 60 mol % terephthalic acid, greater than 10 to about 40 mol % trans-4,4'-stilbenedicarboxylic acid and repeating units from ethylene

glycol, said oriented shaped article being further characterized in that it has an oxygen permeability of less than 5 cc-mil/100 in^2-24 hr-atm.

4,526,823

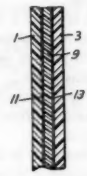
LAMINATE STRUCTURE FOR COLLAPSIBLE DISPENSING CONTAINER

Christopher J. Farrell, and Mark A. Williams, both of Arlington Heights, Ill., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 341,610, Jan. 22, 1982, abandoned. This application Dec. 28, 1983, Ser. No. 565,522

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—35 **6 Claims**



1. A collapsible dispensing container having a crease-retaining laminated tubular body and a thermoplastic headpiece attached thereto, said tubular body comprising an outer layer of a filled plastic material coextensively bonded to an inner thermoplastic layer, wherein said filled plastic material comprises a polymer selected from the group consisting of polypropylene, high impact grade polypropylene and a blend of polypropylene or high impact grade polypropylene with high density polyethylene, and from about 5 to about 80 percent by weight, based on said filled plastic material, of a filler selected from the group consisting of calcium carbonate, talc, mica, glass powder, metal powder and mixtures thereof, and wherein said inner plastic layer is made of high density polyethylene.

4,526,824

THERMAL INSULATION LINING OF CERAMIC MATERIAL FOR A HOT GAS DUCT ENVELOPED IN METAL

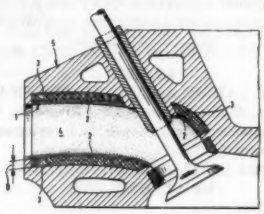
Ulf Dworak, Baltmannsweiler; Hans Olapinski, Aichwald; Dieter Fingerle, Hochdorf, and Ulrich Krohn, Leonberg, all of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 587,035

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309699

Int. Cl.³ B32B *5/08;* **B05D** *1/36*

U.S. Cl. 428—35 **12 Claims**



1. In a thermal insulation lining of ceramic material for a hot gas duct enveloped in cast metal, especially in the cylinder head of an internal combustion engine, the improvement wherein said ceramic material is in the form of a sintered compact of ceramic material and includes a fiber envelope for said sintered compact comprising inorganic fibers and having a thickness of 1 to 7 mm and a density of 0.8 to 1.2 grams per cubic centimeter.

12. A method for the production of thermal insulation lining of claim 1 wherein the inorganic fibers are sprayed onto the sintered compact from a slip containing a ceramic substance.

4,526,825

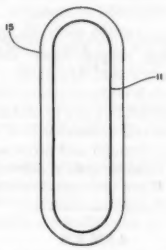
FLUID PERVIOUS THERMOPLASTIC CONTAINING WEB WITH FUSED BARRIER LINES POSITIONED IN REGISTRY ON THE WEB

Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 295,719, Aug. 24, 1981, abandoned. This application Dec. 6, 1982, Ser. No. 447,060

Int. Cl.³ B32B *3/02, 5/14;* **A61F** *13/16*

U.S. Cl. 428—74 **1 Claim**



1. In a wrapped absorbent article having in combination an absorbent batt, a fluid pervious baffle and a fluid permeable wrap containing fusible thermoplastic fibers overlying said absorbent batt, said wrap only having a pre-applied fused peredetermined continuous barrier pattern, said pattern positioned near and corresponding to the periphery of the wrapped absorbent article.

4,526,826

FOAM SEMICONDUCTOR DOPANT CARRIERS

Monika O. Ten Eyck, Lewiston; Martin R. Kasprzyk, Ransomville, both of N.Y., and Richard E. Tressler, Julian, Pa., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Jun. 8, 1983, Ser. No. 502,261

Int. Cl.³ B32B *9/00*

U.S. Cl. 428—131 **2 Claims**

1. A dopant source comprising a dopant carrier comprising heat-bonded particulated refractory material interconnectingly arranged in an open cellular foam wherein the refractory material is selected from at least one of $AlAsO_4$, $YAsO_4$, $Mg_6As_2O_{11}$, $Mg_3As_2O_8$, $Ca_6As_2O_{11}$, $Ca_3As_2O_8$, $Ba_6As_2O_{11}$, $Ba_3As_2O_8$, $Sr_6As_2O_{11}$ and $Sr_3As_2O_8$.

4,526,827

PROCESS AND APPARATUS FOR PRODUCING ADAPTER BLOCKS FOR SYSTEMS WORKING WITH FLUID UNDER PRESSURE

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany, and Hans-Heinrich Glättli, Seestr. 252, CH-8700 Küsnacht, Switzerland

Filed Apr. 20, 1983, Ser. No. 486,615

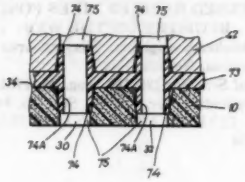
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 3215883

Int. Cl.³ B29D *27/04*

U.S. Cl. 428—137 **11 Claims**

1. An adapter apparatus for use in a fluid system, comprising: an adapter block which is made of a structural foam having a foam core and a solid exterior skin integral with said foam

core, and which has a recess provided in a first surface on one side thereof and a connecting bore extending therethrough from a second surface thereon to said recess in said first surface; a connector part which has a connecting surface spaced from and facing said second surface on said adapter block and which has a connecting bore extending thereinto from said connecting surface; a sealing plate disposed between said adapter block and said connector part, having sealing surfaces



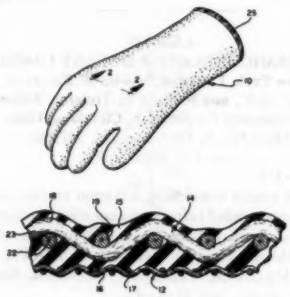
on opposite sides thereof which are respectively adjacent said second surface on said adapter block and said connecting surface on said connector part, having an outward projection on each side thereof, each said projection being disposed in and sealingly engaging a respective one of said connecting bores in said adapter block and said connector part, and having means defining a passageway through said projections and said plate which provides fluid communication between said connecting bores in said adapter block and said connector part.

4,526,828

PROTECTIVE APPAREL MATERIAL AND METHOD FOR PRODUCING SAME

Kenneth E. Fogt; James D. Slosser; John A. Varos, all of Willard, and Gopinath Radhakrishnan, Tiffin, all of Ohio, assignors to Pioneer Industrial Products Company, Willard, Ohio

Filed Jun. 27, 1983, Ser. No. 508,231
Int. Cl.³ A41D *19/00*; D03D *15/00*
U.S. Cl. 428—229 **15 Claims**



1. A protective material comprising:

a base layer of textile material;

an intermediate layer of relatively cut-resistant, fiber material formed from intermeshing strands, defining pores therebetween;

and an outer layer of solid, elastomeric material which retards penetration by liquid;

said pores in said intermediate layer being sufficiently large to permit the passage therethrough of said elastomeric material when the latter is in a liquid state;

said base layer being sufficiently non-porous to prevent the passage entirely therethrough of said elastomeric material when the latter is in a liquid state;

said solid, elastomeric material extending through said intermediate layer to bond the intermediate layer to said base layer, filling the pores in said intermediate layer and substantially totally encapsulating the strands of said intermediate layer.

10. An article of apparel composed at least in part of the protective material of claim 1.

11. A method for producing an article composed of protective material comprising a base layer of textile material, an intermediate layer of relatively cut-resistant fiber material, and an outer layer of solid, elastomeric material which retards penetration by liquid, said method comprising the steps of:

providing said base layer in the form of textile material which is sufficiently non-porous to prevent the passage entirely therethrough of said elastomeric material when the latter is in a liquid state and which will bond to the elastomeric material;

conforming said base layer to a predetermined shape dictated by the shape of said article;

providing said intermediate layer in a form having intermeshing strands defining pores therebetween sufficiently large to permit the passage therethrough of said elastomeric material when the latter is in a liquid state;

mounting said intermediate layer exteriorly to said base layer to conform the shape of said intermediate layer to the shape of the underlying base layer;

providing said elastomeric material in a liquid state;

dipping the base layer and mounted intermediate layer into said liquid elastomeric material;

said dipping step comprising flowing said liquid elastomeric material through said pores in said intermediate layer to cover said base layer, fill said pores and substantially totally encapsulate said strands with said elastomeric material;

and solidifying the liquid, elastomeric material and bonding it to said base layer while the elastomeric material covers the base layer, fills the pores in said intermediate layer and substantially totally encapsulates the strands in the intermediate layer.

4,526,829

THERMOFORMABLE LAMINATE STRUCTURE

James S. Holtrop, South Windsor, Conn., and Richard P. Maurer, Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 553,594, Nov. 21, 1983, Pat. No. 4,476,183, and Ser. No. 553,462, Nov. 21, 1983, Pat. No. 4,489,126. This application Sep. 4, 1984, Ser. No. 647,095
Int. Cl.³ B32B *5/18, 5/28*
U.S. Cl. 428—245 **8 Claims**

1. A moisture-resistant, moldable, thermoformable laminate structure comprising:

(a) a layer of a substantially rigid foamed thermoplastic material, selected from the group consisting of polystyrene, styrene copolymers and polyethylene, said layer having first and second surfaces; and

(b) a coating bonded to one of said surfaces; said coating being a polymer impregnated cloth; said polymer having a softening temperature greater than approximately 75° C.

4,526,830

COATED FABRIC AND MATTRESS TICKING

Daniel Ferziger, 4515 Greystone Ave., Riverdale, N.Y. 10471, and Jerry Lippman, North Bergen, N.J., assignors to Daniel Ferziger, Riverdale, N.Y.

Filed Jul. 23, 1980, Ser. No. 171,327
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—268 **42 Claims**

1. A drapable fabric article such as a mattress ticking or cover, bedspread, upholstery, drapery or the like, prepared by sewing together portions of a sewable and flame retardant fiberglass fabric, said fabric comprising a single base layer of a tightly woven fiberglass fabric having on at least one surface thereof an unfoamed coating of a flame retardant and plasticized polymeric coating composition, said coating having been formed by applying up to about 3 ounces per square yard of

said coating composition directly to and over the entirety of at least one surface of the fiberglass fabric base, wherein said coating is the outermost surface layer of the finished fabric, and is present in an amount sufficient to make said fiberglass fabric base non-abrasive and abrasion resistant, and the coated fabric sewable and drapable, and wherein said fabric article includes a seam formed by sewing together portions of said coated fabric.

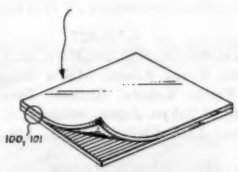
4,526,831
PROCESS FOR THERMOFORMING REINFORCED POLYMER SHEETS

Edward Hatchadoorian, 10 Northcliffe Dr., Wilmington, Del. 19809; George J. Ostapchenko, 202 Saddler Ave., Wilmington, Del. 19803; James L. Patton, Box 3733, Wilmington, Del. 19807, and Harlan S. Young, 5455 Pinehurst Dr., Wilmington, Del. 19808

Division of Ser. No. 390,683, Jun. 21, 1982, Pat. No. 4,457,797, which is a continuation-in-part of Ser. No. 355,711, Mar. 8, 1982, abandoned. This application Feb. 7, 1984, Ser. No. 577,767

Int. Cl.³ B32B *27/34*

U.S. Cl. 428—287 **38 Claims**



1. An article thermoformed from a poly(ethylene terephthalate) sheet reinforced with glass fibers, which fibers are present in an amount within the range of about 5–50% by weight of the sheet composition, said thermoformed article having been thermoformed at a draw ratio of less than about 1.8, defined as the ratio of the initial thickness of the poly(ethylene terephthalate) sheet to the minimum wall thickness of the article, said article having without any further treatment at least one surface having an average roughness, R_A, of about 0.1–0.8 μm, and a concave optical imperfection index of less than about 6% of the surface area as determined by image analysis using a microscope having a magnification of 70 times.

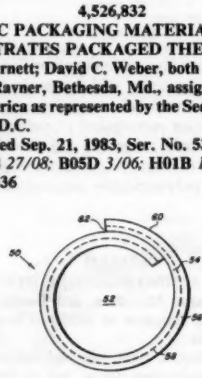
4,526,832
ANTISTATIC PACKAGING MATERIAL AND STEEL SUBSTRATES PACKAGED THEREWITH

Marianne K. Bernett; David C. Weber, both of Alexandria, Va., and Harold Ravner, Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 21, 1983, Ser. No. 534,477

Int. Cl.³ B32B *27/08*; B05D *3/06*; H01B *1/02*; B21D *53/10*

U.S. Cl. 428—336 **15 Claims**



1. An antistatic packaging material comprising an inert, flexible, impervious electroactive polymer film having an F^+-implanted surface with a surface resistivity of no more than about 10^{12} ohms/sq. and an opposite surface also having a surface resistivity no greater than about 10^{12} ohms/sq.

14. A substrate package comprising:

a substrate comprising steel and

one or more polymers, with each polymer being ion-implanted on its surface with F^+ ions to yield a surface resistivity at said polymer surface no greater than about 10^{12} ohms/sq, said one or more F^+ ion implanted polymers being disposed such that the implanted surface thereof is in contact with said substrate so that any static charge that develops upon said substrate transfers to said F^+ ion implanted polymer and is subsequently dissipated.

4,526,833
MAGNETIC RECORDING MEDIUM HAVING A PERFLUOROPOLYETHER POLYMER PROTECTIVE COATING

Mario D. Burguette, Woodbury, Minn., and George D. Foss, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 3, 1983, Ser. No. 538,662

Int. Cl.³ G11B *5/72*

U.S. Cl. 428—336 **17 Claims**

1. A substrate, a surface of which is covered by a protective coating present in an amount sufficient to lubricate said surface and comprising:

(a) a primer layer comprising a polymer made from a phosphorylated monomer or oligomer which is soluble in at least one common organic solvent and which contains at least one aromatic, cycloaliphatic or hetero atom moiety; and

(b) an outer layer comprising a polymer made from at least one perfluoropolyether comprising a plurality of perfluoroalkylene oxide repeating units.

4,526,834
NUCLEAR GRAPHITE

Robert A. Mercuri, Seven Hills, and John M. Criscione, Parma, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 19, 1983, Ser. No. 562,562

Int. Cl.³ B32B *9/00*

U.S. Cl. 428—408 **3 Claims**

1. A high strength, high coefficient of thermal expansion, fine-grained isotropic graphite article produced by mixing a high coefficient-of-thermal-expansion, attritor milled isotropic carbon flour with a binder, said flour comprising 30 to 70 weight percent of the mixture and having a particle size up to 75 microns, said binder being selected from the group consisting of coal tar pitches and petroleum pitches; isostatically molding the mixture at elevated temperature; and graphitizing the molded mixture.

4,526,835
MULTI-LAYER PRINTED CIRCUIT BOARD AND PROCESS FOR PRODUCTION THEREOF

Akio Takahashi, Hitachiota; Takeshi Shimazaki, Hitachi; Motoyo Wajima, Hitachi, and Hirosada Morishita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 351,764, Feb. 24, 1982, abandoned. This application Oct. 12, 1983, Ser. No. 541,248

Claims priority, application Japan, Mar. 4, 1981, 56-29909

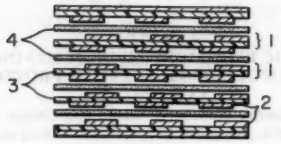
Int. Cl.³ B32B *27/38, 27/28*; C09J *5/02*

U.S. Cl. 428—413 **35 Claims**

1. A multi-layer printed circuit board produced by laminating a plurality of unit circuit sheets having circuit layers on at least one surface of said unit circuit sheets in which a resin composition has been impregnated and cured via prepreg resin sheets, said prepreg resin sheets having been prepared by impregnating reinforcing substrates with a polyimide resin composition which can be cured at a temperature equal to or lower than both the glass transition temperature (Tg_1) of the

cured resin in the unit circuit sheets and the glass transition temperature (Tg_2) of the resin in the prepreg resin sheets after cured, and binding the laminated sheets with heating under pressure at a temperature equal to or lower than both the temperatures of Tg_1 and Tg_2.

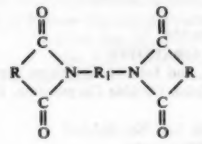
11. A prepreg resin sheet prepared by impregnating a reinforcing substrate with a polyimide resin composition which



can be cured at a temperature equal to or lower than the glass transition temperature (Tg_2) of the resin after cured, said Tg_2 being 170° C. or higher, and wherein the resin composition comprises:

(I) a prepolymer obtained by preliminarily reacting with heating

(a) a bisimide of the formula:


(1)

wherein R is a divalent organic group having at least one carbon-carbon double bond; and R_1 is a divalent organic group having at least two carbon atoms, and

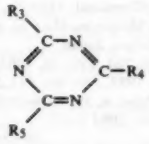
(b) a diamine of the formula:

$$H_2N—R_2—NH_2 \quad (2)$$

wherein R_2 is a divalent organic group having at least two carbon atoms,

(II) an epoxy resin, and

(III) at least one amine selected from the group consisting of a s-triazine type amine compound of the formula:


(3)

wherein R_3, R_4 and R_5 are independently hydrogen, halogen, a hydrocarbon group, an amino group, a hydroxyl group, an amino-substituted hydrocarbon group, a hydroxyl-substituted hydrocarbon group, or a hydrocarbon-substituted amino group, and at least one of R_3, R_4 and R_5 being an amino group or an amino-substituted hydrocarbon group, and dicyandiamide.

4,526,836

MAGNETIC RECORDING MEDIA COMPRISING A REACTION PRODUCT OF A SPECIFIC TYPE OF FLUORINE RESIN AND A CURING POLYMER MATERIAL AS A BINDER IN THE MAGNETIC LAYER THEREOF

Yasuo Mukai, Yokohama, and Yosuke Takazawa, Yamato, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Sep. 13, 1984, Ser. No. 650,672

Claims priority, application Japan, Sep. 16, 1983, 58-169261

Int. Cl.³ G11B *5/68*

U.S. Cl. 428—421 **12 Claims**

1. A magnetic recording medium which comprises a non-magnetic support and a magnetic layer formed on at least one side of said support, said magnetic layer being made of a magnetic composition which comprises magnetic particles dispersed throughout a binder of a reaction product between a fluorine resin having at least two hydroxyl groups in one molecule of said resin and being soluble in an organic solvent and a polymer material having functional groups capable of condensation reaction with said fluorine resin through the at least two hydroxyl groups.

4,526,837

MAGNETIC RECORDING MEDIUM

Akira Ohtsuki; Ryozo Konno; Makio Sugai; Masaharu Nishimatsu; Yuichi Kubota; Kazushi Tanaka, and Osamu Shinoura, all of Tokyo, Japan, assignors to Toyo Ink MFG. Co., Ltd. and TDK Electronics Co., Ltd., both of Tokyo, Japan

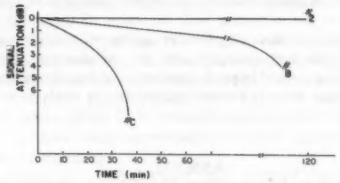
PCT No. PCT/JP81/00204, § 371 Date Apr. 23, 1982, § 102(e) Date Apr. 23, 1982, PCT Pub. No. WO82/00914, PCT Pub. Date Mar. 18, 1982

PCT Filed Aug. 28, 1981, Ser. No. 375,261

Claims priority, application Japan, Aug. 28, 1980, 55-117812

Int. Cl.³ G11B *5/70*

U.S. Cl. 428—425.9 **6 Claims**



1. A magnetic recording medium comprising a substrate and a magnetic recording layer, said magnetic recording layer comprising a coating material containing a magnetic powder dispersed in a radiation cross-linked or radiation polymerized mixture of a resin binder, together with from 0.5 to 10 wt% based on the weight of magnetic powder, of a phosphoric ester having at least one polymerizable, unsaturated double bond.

4,526,838

POLYAMINO-BIS-IMIDE RESIN

Atsushi Fujioka; Yasuo Miyadera, and Tomio Fukuda, all of Shimodate, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,554

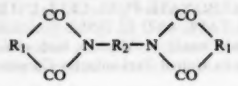
Claims priority, application Japan, Sep. 8, 1982, 57-156046

Int. Cl.³ C08G *73/10, 73/12*

U.S. Cl. 428—458 **12 Claims**

1. A curable polyamino-bis-imide resin, obtained by the thermal reaction of:

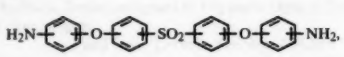
(A) a bis-imide represented by the general formula I:



(I)

wherein R_1 stands for a divalent organic group having a carbon-carbon double bond and R_2 for a divalent aromatic organic group having 1 to 3 benzene rings, with

(B) a diamine represented by the general formula II:



(II)

the mole ratio of said bis-imide (A) to said diamine (B) being in the range of 1:0.1 to 1:1.

4,526,839

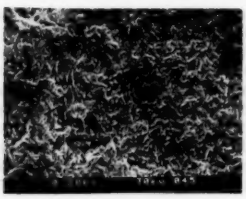
PROCESS FOR THERMALLY SPRAYING POROUS METAL COATINGS ON SUBSTRATES

Herbert Herman, Port Jefferson, and Daniel R. Marantz, Port Washington, both of N.Y., assignors to Surface Science Corp., Yonkers, N.Y.

Filed Mar. 1, 1984, Ser. No. 584,984

Int. Cl.³ C23C *7/00*; B32B *5/16*

U.S. Cl. 428—550 **29 Claims**



23. A substantially planar porous metal coated substrate which comprises a substrate, a thermal spray coating of the metal on the substrate, rolled so as to render the sprayed coating substantially planar, and then part of the surface removed to improve planarity and to reopen some of the pores of the coating.

4,526,840

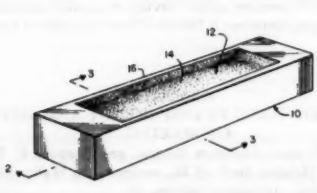
BAR EVAPORATION SOURCE HAVING IMPROVED WETTABILITY

Charles F. Jerabek, Rye, N.H., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 11, 1983, Ser. No. 465,706

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—596 **3 Claims**



1. An intermetallic composite, bar evaporation source for use in the evaporation of a given metal, said source being comprised of a mixture of borides and nitrides and having an evaporant cavity therein, the improvement comprising: said cavity including a surface and a spray coating of said given metal in intimate contact with said surface.

4,526,841

FIBER-REINFORCED METAL COMPOSITE MATERIAL

Kohji Yamatsuta, Osaka, and Ken-ichi Nishio, Shiga, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Division of Ser. No. 285,974, Jul. 23, 1981, Pat. No. 4,465,741. This application Apr. 17, 1984, Ser. No. 601,244

Claims priority, application Japan, Jul. 31, 1980, 55-106154; Apr. 7, 1981, 56-52616; Apr. 7, 1981, 56-52617

Int. Cl.³ B32B *15/20*; B32D *19/02*

U.S. Cl. 428—614 **13 Claims**

1. A method for preparing a fiber-reinforced metal composite material comprising:

incorporating into a metal or alloy matrix at least one element selected from the group consisting of tin, cadmium and antimony in an amount of 0.0005 to 10% by weight; and

contacting the thus prepared matrix containing said element with an inorganic fiber reinforcing material to form the fiber-reinforced metal composite material.

4,526,842

THREE-LAYER METAL LAMINATE WITH BIMETALLIC EFFECT, AND THE APPLICATION OF THIS LAMINATE IN COOKING VESSELS

Svein Eide, Sandved, Norway, assignor to Ardal Og Sunndal Verk a.s., Oslo, Norway

Filed Oct. 4, 1983, Ser. No. 538,928

Claims priority, application Norway, Oct. 11, 1982, 823396

Int. Cl.³ A41J *36/02*

U.S. Cl. 428—617 **9 Claims**

1. A three-layer metal laminate for use in cooking vessels, said laminate comprising:

a center layer of a first metal having a relatively high thermal conductivity;

first and second outer layers on respective opposite sides of said center layer, said first and second layers being of the same second metal, different from said first metal of said center layer, having a relatively low thermal conductivity;

said first and second metals having different coefficients of thermal expansion;

said first outer layer having a thickness of from 5 to 10% of the thickness of said center layer; and

said second outer layer having a thickness at least twice said thickness of said first outer layer.

4,526,843

FILM BONDED FUEL CELL INTERFACE CONFIGURATION

Arthur Kaufman, West Orange, and Peter L. Terry, Chatham, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

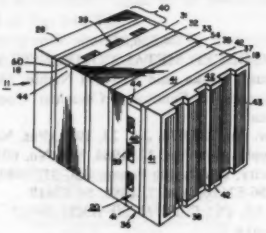
Continuation of Ser. No. 430,148, Sep. 30, 1982, abandoned. This application Apr. 6, 1984, Ser. No. 597,559

Int. Cl.³ H01M *8/04*

U.S. Cl. 429—26 **11 Claims**

1. A fuel cell stack comprising a plurality of stacked elements; at least one corrosion resistant, electrically conductive, fluid impervious interface arranged between two of said elements which are adjacent to one another, said interface comprising a first conductive layer and a second perforate conductive layer being bonded to each other and to the surface of at least one of said two elements by a hot-pressed resin,

said first and second conductive layers providing bridging electrical contact between said two elements,



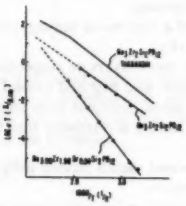
said resin filling substantially any remaining void space between said two elements.

4,526,844

RHOMBOHEDRAL NASICON COMPOUND AND BATTERY

Bulent E. Yoldas, and Isabel K. Lloyd, both of Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1983, Ser. No. 485,087
Int. Cl.³ H01M *8/10, 6/18*
U.S. Cl. 429—30 **10 Claims**



1. A nasicon compound which is rhombohedral at room temperature, having the general formula

$$M_{1+x+0.02y+0.04z}M'_{2-0.02(y+z)}M''_{0.02y}M'''_{0.02z}M''''_{z}M'''''_{3-x}O_{12}$$

where

M is selected from the group consisting of Li, Na, K, Ag, and mixtures thereof,

M′ is selected from the group consisting of Zr, Ti, Hf, and mixtures thereof,

M″ is selected from the group consisting of 0 to 15 molar % of Y, Sc, La, and mixtures thereof,

M‴ is selected from the group consisting of 0 to 15 molar % of Mg, Ca, Sr, Ba, and mixtures thereof,

M⁗ is selected from the group consisting of Si, Ge, and mixtures thereof,

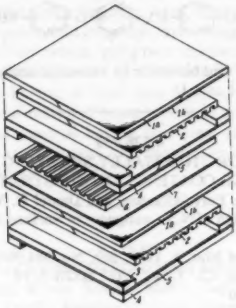
M⁗′ is selected from the group consisting of P, As, and mixtures thereof, x is about 1.9 to about 2.2, y is 0 to about 15 and z is 0 to about 15.

4,526,845

MOLTEN CARBONATE FUEL CELL INTEGRAL MATRIX TAPE AND BUBBLE BARRIER

Carl A. Reiser, and Donald L. Maricle, both of Glastonbury, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 307,338, Sep. 30, 1981, Pat. No. 4,411,968. This application Jul. 25, 1983, Ser. No. 516,833
The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.
Int. Cl.³ H01M *4/86*
U.S. Cl. 429—41 **16 Claims**



1. A matrix material for a molten carbonate fuel cell comprising a fine pore, gas permeable, anode stable metal layer having about 40% to about 50% by volume porosity bonded to a matrix tape, the matrix tape comprising a mixture of particles inert to molten carbonate electrolyte having a particle size less than about 1 micron, ceramic particles having a particle size greater than about 25 microns, and an organic polymeric binder material, the binder material being present in an amount at least about 25% by volume, the matrix tape being flexible, pliable, and compliant at room temperature.

4,526,846

CORROSION PREVENTION ADDITIVE

Susan D. Kearney, Brockton, Mass., and Peter R. Moses, Windham, N.H., assignors to Duracell Inc., Bethel, Conn.

Filed Jun. 14, 1982, Ser. No. 387,738
Int. Cl.³ H01M *6/14, 6/16*
U.S. Cl. 429—194 **13 Claims**

1. A non-aqueous electrochemical cell comprising an alkali or alkaline earth metal anode, an electrolyte comprised of an electrolyte salt dissolved in a non-aqueous electrolyte solvent, a cathode comprised of a material which provides a potential above 2.5 volts and one or more iron containing components, normally subject to accelerated corrosion caused by said electrolyte salt dissolved in said solvent, kept at cathode potentials above 2.5 volts, characterized in that said cell further contains a corrosion inhibiting additive, dissolved in said electrolyte, comprised of a tertiary amine having no acidic protons in an amount ranging between 0.1% to 10% by weight of said electrolyte.

4,526,847

IMAGE RECEIVING TRANSPARENCY AND METHOD OF MAKING

Stephen L. Walker, Hoffman Estates, and Beatrice E. Thorpe, Arlington Heights, both of Ill., assignors to Weber Marking Systems, Inc., Arlington Heights, Ill.

Filed Apr. 15, 1983, Ser. No. 485,207
Int. Cl.³ G03G *7/00;* **B32B** *27/10*
U.S. Cl. 430—18 **9 Claims**

8. An imaged transparency which comprises a transparency for receiving adherently thereon a toner-developed latent

electrostatic image, which comprises: a polyester resin film sheet; and an image-receiving coating on at least one surface of said sheet and comprising: (a) nitrocellulose, (b) a plasticizer, and (c) a particulate material dispersed in the coating; and a fused toner-developed latent electrostatic image on said coating.

4,526,848

ELECTROPHOTOGRAPHIC PROCESS WITH A.C. CHARGER PRODUCING GREATER POSITIVE CHARGE

Takao Okada; Akitoshi Toda, and Yoshiyuki Mimura, all of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan

Filed Nov. 7, 1983, Ser. No. 549,069

Claims priority, application Japan, Nov. 27, 1982, 57-208313

Int. Cl.³ G03G *13/052, 13/24*

U.S. Cl. 430—55 **6 Claims**

1. An electrophotographic process employing an electrophotographic member of a basic construction in which a photoconductive layer and a transparent insulator layer are sequentially laminated on the surface of a conductive supporter so that said photoconductive layer is between the transparent insulator layer and the conductive supporter, comprising the steps of:

providing a uniform primary charge upon the exposed surface of said transparent insulator layer of said photosensitive member and having a polarity which is the same as the polarity of the charging source;

providing a uniform charge having an opposite polarity along the surface at the interface between the insulator layer and the photoconductive layer;

performing a secondary charging during an imagewise exposure by applying an a.c. voltage a firing angle of which during the negative half wave is controlled in phase to be within a phase angle corresponding to a lower voltage than the firing potential so that the positive discharge period may be longer than the negative one during each period; and

forming an electrostatic latent image on the surface of said transparent insulator layer by applying a uniform exposure.

4,526,849

MULTILAYER ELECTROPHOTOGRAPHIC AMORPHOUS SILICON ELEMENT FOR ELECTROPHOTOGRAPHIC COPYING PROCESSES

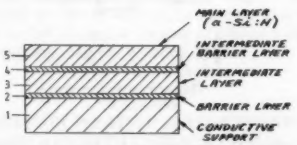
Gabriël N. M. M. van der Voort, Delft, and Marinus Groeneveld, Eindhoven, both of Netherlands, assignors to Océ-Nederland B.V., Venlo, Netherlands

Filed Oct. 17, 1983, Ser. No. 542,641

Claims priority, application Netherlands, Oct. 21, 1982, 8204056

Int. Cl.³ G03G *5/082*

U.S. Cl. 430—57 **8 Claims**



1. An electrophotographic element for use in electrophotographic copying processes, comprising an electrically conductive support having applied thereto a barrier layer consisting essentially of a doped hydrogen-containing amorphous silicon, next to said barrier layer an intermediate layer consisting essentially of hydrogen-containing amorphous silicon, next to said intermediate layer an intermediate barrier layer consisting essentially of doped hydrogen-containing amorphous silicon, and on a said intermediate barrier layer a main layer consisting essentially of hydrogen-containing amorphous silicon, said barrier layer and said intermediate barrier layer being of the same conductivity type, and said intermediate layer and said main layer each being entirely undoped when said barrier layer and intermediate barrier layer are of p-type conductivity and, when said barrier layer and said intermediate barrier layer are of n-type conductivity, being either entirely undoped or doped with up to about 30 pm of a dopant sufficient to cause said main and intermediate layers to be preferentially p-type conductive.

4,526,850

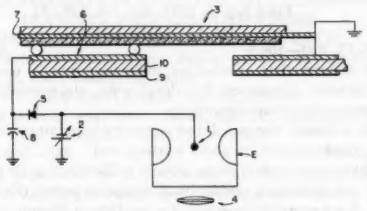
DIODE BIAS ELECTROPHOTOGRAPHIC TONING SYSTEM AND METHOD

John D. Plumadore, Westfield, Mass., assignor to Photon Chroma, Inc., Westfield, Mass.

Filed Jun. 27, 1983, Ser. No. 508,459

Int. Cl.³ G03G *13/06, 15/06*

U.S. Cl. 430—103 **20 Claims**



1. A bias diode controlling toning system for electrophotographic materials and operable with an electrophotographic copying machine and the like wherein charging and toning take place at different times, comprising, in combination:

corona-charging means;

a development electrode means;

a single variably adjustable voltage D.C. power supply means connected with said development electrode means and said corona-charging means for supplying a first predetermined corona-charging voltage level and a second predetermined toning voltage level; and

a single diode means connected in circuit with and between said development electrode means and said power supply means in such a manner for preventing the passage of current from said power supply means to said development electrode means when said power supply means is set at said first predetermined corona-charging voltage level so as to prohibit arcing between said development electrode means and said electrophotographic material, and for permitting the passage of current from said development electrode means to said power supply means when said power supply means is set at said second predetermined toning voltage level so as to permit said development electrode means to be maintained at a voltage level which is the same as said second predetermined voltage level set within said power supply means.

11. A method of operating an electrophotographic copying machine and the like for use with electrophotographic materials wherein charging and toning take place at different times, said method comprising the steps of:

providing a corona-charging means;

providing a development electrode means;

connecting a single variably adjustable voltage D.C. power supply means to said development electrode means and said corona-charging means so as to supply a first predetermined corona-charging voltage level and a second predetermined toning voltage level; and

connecting a single diode means in circuit with and between said development electrode means and said variably adjustable D.C. power supply means in such a manner as to prevent the passage of current from said power supply

means to said development electrode means when said power supply means is set at said first predetermined corona charging voltage level so as to prohibit arcing between said development electrode means and said electrophotographic material, and for permitting the passage of current from said development electrode means to said power supply means when said power supply means is set at said second predetermined toning voltage level so as to permit said development electrode means to be maintained at a voltage level which is the same as said second predetermined voltage level set within said power supply means.

4,526,851

MAGNETIC DEVELOPER COMPOSITIONS

Edward M. Boughton, Palos Verdes Estates, Calif., and Lewis O. Jones, Webster, N.Y., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sep. 6, 1983, Ser. No. 529,792

Int. Cl.³ G03G *9/08*

U.S. Cl. 430—106.6 **41 Claims**

1. A particulate, conductive, magnetic toner for use as a one component developer for developing electrostatic charge patterns, the toner comprising:

(a) a binder that is solid at ambient temperature and that is rendered molten under heating; and

(b) ferrous carbon in an amount sufficient that (i) the toner can produce a visible, black image on paper, (ii) the toner has a magnetic moment of at least about 20 emu/gram, and (iii) the toner has a resistivity of from about 10^6 to about 10^{17} ohm-cm, the ferrous carbon containing from about 15 to about 80% by weight ferrous metal and from about 20 to about 85% by weight carbon,

the ferrous carbon being a fibrous, particulate carbonaceous material comprising carbon fibers and a ferrous group metal component dispersed throughout the carbon fibers as nodules that are intimately associated with and at least partially bonded to the carbon fibers.

4,526,852

LIQUID DEVELOPER FOR DEVELOPING ELECTROSTATIC CHARGE IMAGES AND PROCESS FOR ITS PREPARATION

Heinz Herrmann, and Hans-Joachim Schlosser, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 16, 1983, Ser. No. 562,013

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247925

Int. Cl.³ G03G *9/12*

U.S. Cl. 430—115 **13 Claims**

1. A liquid developer containing negatively charged toner particles for developing electrostatic charge images, which comprises:

a carrier liquid of high electric resistivity and low dielectric constant;

pigments or dyes;

a N-vinylpyrrolidone-containing polymer; and

at least one wax which is readily soluble in said carrier liquid at increasing temperatures, but difficultly soluble a room temperature in aliphatic hydrocarbon carrier liquids, which reduces the specific electric conductivity of the liquid developer and which has a softening point within a range of from about 50° to 120° C. and an acid number of from about 0 to about 200, said wax (i) being an acid or ester wax derived from montan wax, hydrated castor oil or polyoctadecene, and (ii) being present in said carrier liquid as fine particles or microcrystalline structures having a size of between about 0.1 and a few tens of microns.

4,526,853

METHOD OF PROVIDING AN INCREASED BRIGHTENING EFFECT AND SILVER HALIDE PHOTOGRAPHIC MATERIAL HAVING INCREASED BRIGHTENING EFFECT

Toyoki Nishijima; Masao Sasaki, and Kaoru Onodera, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1983, Ser. No. 541,973

Claims priority, application Japan, Oct. 15, 1982, 57-180939; Oct. 18, 1982, 57-182611

Int. Cl.³ G03C *5/14*

U.S. Cl. 430—139 **13 Claims**

1. A silver halide color photographic material having formed on a hydrophobic support at least one silver halide emulsion layer, a layer containing a brightening agent, a layer containing a compound that is capable of trapping the brightening agent, and at least one layer containing a UV absorber, said layer containing a compound capable of trapping the brightening agent being separate from the layer containing the brightening agent and positioned more remote from the support than the layer containing the brightening agent, the UV absorber layer being positioned more remote from the support than the silver halide emulsion layers and the layer containing the brightening agent, the compound capable of trapping the brightening agent being incorporated in at least one of the UV absorber containing layers or a layer that is more remote from the support than the most remote UV absorber containing layer.

4,526,854

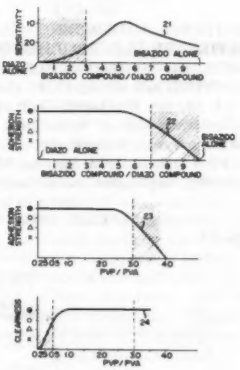
PHOTORESIST COMPOSITION WITH WATER SOLUBLE BISAZIDE AND DIAZO COMPOUND

Shingo Watanabe, Himeji, and Takeo Itou, Fukaya, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Saitama, Japan

Continuation-in-part of Ser. No. 413,895, Sep. 1, 1982,. This application Feb. 18, 1983, Ser. No. 467,895

Int. Cl.³ G03C *1/54, 1/60, 1/71*

U.S. Cl. 430—176 **2 Claims**



1. A photoresist composition for forming a pattern on the inner surface of a face plate of a color picture tube, said composition comprising an admixture

of from 1 to 30% by weight based on the total amount of the photoresist of a water-soluble bisazido compound,

a photosensitive water-soluble diazo compound, and

from 0.5 to 50% by weight based on the total amount of the photoresist of a water-soluble polymeric material which when exposed to ultraviolet rays is capable of being cross-linked with at least one of said water-soluble bisazido compound and said water-soluble diazo compound, said

polymeric material being an admixture of polyvinyl pyrrolidone and polyvinyl alcohol in a mixing ratio by weight of 0.5 to 3 parts polyvinyl pyrrolidone to 1 part of polyvinyl alcohol and the mixing ratio by weight of said water-soluble bisazido compound to said water-soluble diazo compound is 3 to 7 parts of said water soluble bisazido compound to 1 part of said water-soluble diazo compound.

4,526,855

PROCESS FOR THE PRODUCTION OF THERMODYNAMICALLY STABLE SOLID ION CONDUCTOR MATERIALS

Peter Hartwig, Weinheim; Werner Weppner, Stuttgart, and Winfried Wichelhaus, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft Zur Foerderung Der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany

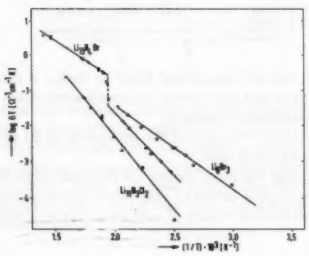
Division of Ser. No. 145,638, May 1, 1980, Pat. No. 4,386,020. This application May 2, 1983, Ser. No. 490,807

Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918940

The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.

Int. Cl.[3] **H01M** *6/18;* **H01B** *1/06;* **C01D** *15/00;* **C01B** *11/00*

U.S. Cl. 429—191 **6 Claims**



1. Process for the production of solid ion conductor materials based on lithium or sodium compounds which are in thermodynamic equilibrium with the corresponding alkali metal and have a high decomposition voltage, which process comprises reacting together in such amounts and for a sufficient length of time to form a radiographically phase-pure product, lithium nitride and a lithium halide selected from the group consisting of lithium chloride, lithium bromide and lithium iodide, by intimately mixing under an inert gas in the molar proportion corresponding to the desired composition said lithium nitride and lithium halide, pressing the mixture under a pressure of at least 50 MPa to form a pressed body, rapidly heating the pressed body in an atmosphere of nitrogen to 460° to 550° C. and thereafter annealing said body, in the case of lithium chloride at 350° to 450° C., in the case of lithium bromide at 330° to 430° C., and in the case of lithium iodide at 200° to 350° C. until the reaction is ended.

4,526,856

LOW STRIATION POSITIVE DIAZOKETONE RESIST COMPOSITION WITH CYCLIC KETONE(S) AND ALIPHATIC ALCOHOL AS SOLVENTS

James M. Lewis, Williamsville; Robert A. Owens, East Amherst; Richard F. Sweeney, Elma; Ronald W. Wake, West Seneca, all of N.Y., and Robert E. Rinehart, Newtown, Conn., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 23, 1983, Ser. No. 497,390

Int. Cl.[3] **G03C** *1/60, 1/54;* **G03F** *7/26*

U.S. Cl. 430—191 **18 Claims**

1. A positive photoresist formulation capable of providing no observable striation and excellent wetting properties comprising an admixture in solution of:

(a) a diazo ketone photosensitive compound

(b) an alkali soluble resin

(c) a cyclic ketone solvent selected from the group consisting of cyclopentanone and blends of cyclopentanone and cyclohexanone

(d) an aliphatic alcohol solvent having from 6 to 12 carbon atoms and wherein the cyclic ketone comprises at least 20 percent of the total solvent and the alcohol comprises at least 10 percent of the total solvent and wherein (c) and (d) are present in an amount sufficient to provide at least low striation and good wetting properties to said formulation when used as a positive photoresist.

4,526,857

IMAGE FORMATION BY SILVER SALT DIFFUSION TRANSFER PROCESS COMPRISING MERCAPTOTRIAZOLE AND THIOURACIL

Yoshio Idota, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

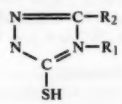
Filed Apr. 12, 1984, Ser. No. 599,446

Claims priority, application Japan, Apr. 20, 1983, 58-69781

Int. Cl.[3] **G03C** *5/54, 1/10*

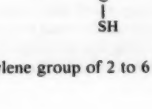
U.S. Cl. 430—248 **16 Claims**

1. In a process of forming an image by silver salt diffusion transfer comprising processing a photosensitive element provided with a layer of photosensitive silver halide emulsion on a support, and an image-receiving element provided with an image-receiving layer containing silver-precipitating nuclei on a support, with a processing composition containing an alkali, a hydroxylamine, and a silver halide solvent; a process of forming an image by silver salt diffusion transfer characterized in that said image-receiving element contains a compound represented by general formula (I) and a compound represented by general formula (II):

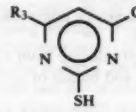


(I)

where R_1 is a hydrogen atom; and alkyl group of 1 to 6 carbon atoms which are not substituted or are substituted by halogens, R_9CONH— (where R_9 is an aryl group, or an alkyl group of 1 to 6 carbon atoms), or aryl groups; an alkenyl group of 1 to 6 carbon atoms; an aryl grpup; —SH; —SR_4 (where R_4 is an alkyl group of 1 to 3 carbon atoms); —OH; or —$N(R_5)_2$ (where R_5 is a hydrogen atom or an alkyl group of 1 or 2 carbon atoms); and R_2 is a hydrogen atom; an alkyl group of 1 to 6 carbon atoms which are not substituted or are substituted by halogens, R_9CONH— (where R_9 is an aryl group, or an alkyl group of 1 to 6 carbon atoms), or aryl groups; an alkenyl group of 1 to 6 carbon atoms; an aryl group; —NH_2; an aryl group which is substituted by R_7CONH— (where R_7 is an alkyl group of 1 or 2 carbon atoms), —NO_2, a halogen atom, OR_8 (where R_8 is an alkyl group with 1 or 2 carbon atoms), —COOH, or —SO_3H; —OH; —SH; or



(where R_6 is an alkylene group of 2 to 6 carbon atoms); and



(II)

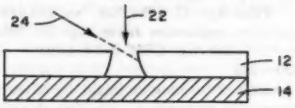
where R_3 is a hydrogen atom or an alkyl group of 1 to 6 carbon atoms.

4,526,858

METHOD FOR FABRICATING SUPERCONDUCTING WEAK-LINKS USING ELECTRON BEAM LITHOGRAPHY

James E. Lukens, Stony Brook, and Paul M. Mankiewich, East Setauket, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 11, 1982, Ser. No. 338,821
Int. Cl.³ G03C 5/00
U.S. Cl. 430—296 **8 Claims**



1. A method for fabricating non-hysteretic weak-links, comprising the steps of:
obtaining a substrate;
overlaying on said substrate a single film of an electron resist material forming an assembly;
heating said assembly at a predetermined temperature for a preselected time;
controllably exposing selected regions of said electron resist with a fine electron beam;
developing said selectively exposed electron resist in a solvent for forming a mask having an "H" shape where the cross member of the "H" is a gap having an undercut profile;
directing a first stream of metallic atoms at normal incidence to said mask to form a first layer of metal on said substrate in the region of the cross member of the "H";
directing a second stream of metallic atoms at such an oblique angle of incidence to said mask that said second stream of metal atoms forms a second layer of metal on said substrate in the region of the side members of the "H"; and
lifting-off the resist mask;
whereby, a non-hysteretic weak-link is fabricated.

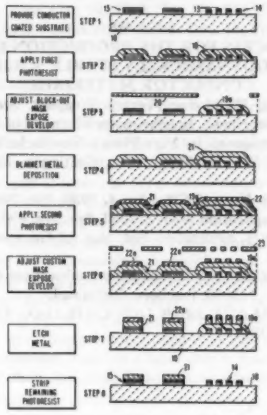
4,526,859

METALLIZATION OF A CERAMIC SUBSTRATE

Richard G. Christensen, Wingdale, and Robert L. Moore, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,661
Int. Cl.³ H05K 3/10
U.S. Cl. 430—314 **17 Claims**

1. A process for depositing metal at only selected subdivided portions of a metallization pattern pre-existing on a substrate comprising the steps of:
(A) providing a substrate having said metallization pattern at a major surface;
(B) blanket depositing a first photoresist layer to cover the said substrate major surface and said metallization pattern;
(C) selectively exposing and developing the first photoresist layer on a pattern forming a first mask opposite to and only over a subdivided region of said metallization pattern;
(D) depositing a blanket layer of said metal, over the entire substrate major surface;
(E) depositing a second blanket layer of photoresist over the substrate major surface;
(F) selectively exposing though a second mask and developing the second photoresist layer to define a second resist mask over and opposite to a second subdivided region of said metallization pattern;
(G) etching the portions of the deposited metal layer which remain exposed; and,
(H) solvating the resist masks for removal thereof together with overlying layers of said metal thereon over the first said subdivided region of said metallization pattern.

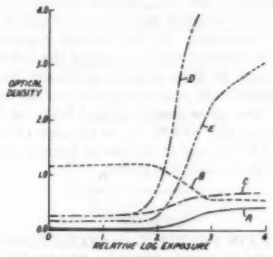


4,526,860

PHOTOGRAPHIC PROCESS

Jonathan P. Kitchin, Ware, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 28, 1983, Ser. No. 460,474
Int. Cl.³ G03C 5/32
U.S. Cl. 430—373 **10 Claims**



1. A photographic process for the development of an imagewise exposed silver halide photographic element which comprises treating said element with a developer solution to form a silver image, treating the developed element with fixer to remove undeveloped silver halide, oxidizing the fixed silver image to form a substantially insoluble silver salt and thereafter treating the element with:
(i) color developer and hydrogen peroxide in the presence of a color coupler, or

(ii) a dye-forming developing agent, and hydrogen peroxide to form a dye in said imaged areas.

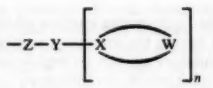
4,526,861

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL COMPRISING COUPLER HAVING NITROGEN-CONTAINING HETEROCYCLIC RING

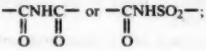
Seiji Ichijima, and Takeshi Hirose, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 27, 1984, Ser. No. 593,795
Claims priority, application Japan, Mar. 29, 1983, 58-54742
Int. Cl.³ G03C *7/32, 7/26, 7/00, 1/40*
U.S. Cl. 430—385 **29 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer, the color photographic light-sensitive material containing a coupler having a group represented by the general formula (I)



wherein W represents



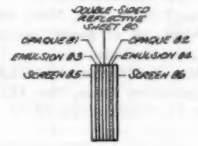
X represents an organic residue necessary for forming a 5-membered or 6-membered nitrogen-containing heterocyclic ring or a condensed ring thereof together with W; Y represents an organic residue connecting Z and X and containing at least one carbon atom which is bonded to Z; Z represents an oxygen atom or a sulfur atom; and n represents an integer of 1 to 2; at the coupling position of the coupler.

4,526,862

FILM-BASED DUAL ENERGY RADIOGRAPHY

Norbert J. Pelc, Wauwatosa, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 13, 1983, Ser. No. 541,468
Int. Cl.³ G03C *1/84, 1/92;* **G03B** *41/16, 11/00*
U.S. Cl. 430—496 **19 Claims**



1. A film package for forming on one radiographic film an image of an anatomical region corresponding to an image made by exposing the region to one x-ray energy spectral band and for forming on another film an image of the same region corresponding to an image made by exposing the region to another x-ray energy spectral band where both images are made simultaneously by exposing the region to a polyenergetic x-ray beam having a broad energy spectrum, said package being adapted for use with first and second parallel intensifying screens arranged in the path of the beam emergent from the region, which screens are excited to luminescence by the x-ray energy spectra that they absorb, said film package comprising:

first and second parallel radiographic films fixedly joined together along at least two of their corresponding edges to form a pocket between the films, the photosensitive image recording surfaces of said first and second films being faced away from each other outside of the pocket for interfacing with said first and second intensifying screens, respectively, during the polyenergetic beam exposure, and

an x-ray transmissive and light-opaque sheet inserted in said pocket between the films for transmitting to said second film and second screen some of the x-radiation having energy spectra not absorbed by said first luminescent intensifying screen and first film and for preventing light from one intensifying screen from exposing the film interfaced with the other screen.

4,526,863

COLOR PHOTOGRAPHIC MATERIAL COMPRISING SILVER HALIDE LIGHT-SENSITIVE AND NON LIGHT-SENSITIVE LAYERS

Keiji Mihayashi; Shunji Takada, and Hidetoshi Kobayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 21, 1984, Ser. No. 592,042
Claims priority, application Japan, Mar. 22, 1983, 58-47601
Int. Cl.³ G03C *1/46, 1/76, 7/00*
U.S. Cl. 430—505 **32 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon at least two light-sensitive silver halide emulsion layers which are sensitive to light of substantially the same spectral region and a relatively light-insensitive layer containing silver halide, zinc oxide or titanium oxide positioned between the two light-sensitive silver halide emulsion layers and at least one of the two light-sensitive silver halide emulsion layers containing a compound represented by the following general formula (I):

A—B (I)

wherein A represents a residue of a compound capable of coupling with the oxidation product of an aromatic primary amine developing agent by removal of a hydrogen atom from the active position of the compound, and B represents a group which is released on coupling and exhibits a fogging function in a developing solution.

4,526,864

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

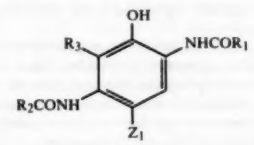
Shun Takada; Kaoru Onodera, and Takashi Kadowaki, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1983, Ser. No. 566,820
Claims priority, application Japan, Dec. 30, 1982, 57-228285
Int. Cl.³ G03C *7/26*
U.S. Cl. 430—551 **43 Claims**

1. In a silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer,

said silver halide emulsion layer contains in combination at least one of those cyan couplers having the following Formula I and at least one of those compounds having the following Formula II or III:

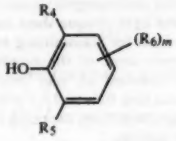
Formula I



wherein R_1 is an aryl radical or a heterocyclic radical; R_2 is an alkyl radical or an aryl radical; R_3 is a hydrogen atom, a halo-

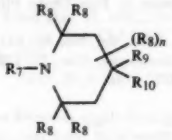
gen atom, an alkyl radical or an alkoxy radical; and Z_1 is a hydrogen atom or a radical that can be split off by the reaction with the oxidized product of an aromatic primary amine color developing agent,

Formula II



wherein R_4 and R_5 each is an alkyl radical; R_6 is a hydrogen atom, an alkyl radical, an —NHR_6' radical, an —SR_6' radical (wherein R_6' is a monovalent organic radical) or a —$COOR_6''$ radical (wherein R_6'' is a hydrogen atom or a monovalent organic radical); and m is an integer of from 0 to 3,

Formula III



wherein R_7 is a hydrogen atom, a hydroxyl radical, an oxy radical (—O radical), an —SOR_7' radical, an —SO_2R_7'' radical (wherein R_7' and R_7'' each is a monovalent organic radical), an alkyl radical, an alkenyl radical, an alkynyl radical or a —COR_7''' radical (wherein R_7''' is a hydrogen atom or a monovalent organic radical); each R_8 is an alkyl radical; R_9 and R_{10} each is a hydrogen atom or an —OCOR′ radical (wherein R′ is a monovalent organic radical), said R_9 and said R_{10} together may form a heterocyclic radical; and n is an integer of from 0 to 4.

4,526,865

MICROORGANISM IDENTIFICATION TECHNIQUE

Robert E. Silman, London, England, assignor to AMB Systems Corp., San Diego, Calif.

Filed Jan. 22, 1982, Ser. No. 341,810

Claims priority, application United Kingdom, Oct. 1, 1981, 8129683

Int. Cl.³ C12Q *1/16, 1/04, 1/10;* **G01N** *33/58*

U.S. Cl. 435—35 **16 Claims**

1. A technique for identifying an unknown micro-organism comprising the steps of:

A. Preparing a specimen of the micro-organism to which a radioactive emissive agent has been added that is actively incorporated into the products of metabolism of the micro-organism to produce a mix of radioactive peptide or protein emissive products in a manner that depends on the metabolic mechanism of the micro-organism,

B. separating the peptide or protein emissive products in the mix resulting from said preparation of a specimen,

C. detecting the separated peptide or protein emissive products to derive a characteristic pattern therefrom that depends on the conditions under which the specimen is prepared, which conditions are standardized to provide a repeatable characteristic pattern functioning as a unique identifier for the unknown micro-organism, and

D. comparing the identifier for the unknown micro-organism with stored information relating to the characteristic patterns of known micro-organisms to determine the identification of the unknown.

4,526,866

ANGIOTENSIN I-CONVERTING ENZYME INHIBITOR AND PREPARATION OF THE SAME

Yasuji Kido; Tsutomu Yoshida: Toshinari Hamakado; Masami Anno; Takahiro Harada, and Yoshinobu Motoki, all of Yamaguchi, Japan, assignors to Fujizoki Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1983, Ser. No. 482,356

Claims priority, application Japan, Apr. 13, 1982, 57-60381

Int. Cl.³ C12P *21/00, 1/06;* **C12R** *1/465*

U.S. Cl. 435—68 **4 Claims**

1. An angiotensin I-converting enzyme inhibitor IS83 being a polypeptide and having the following properties:

(a) having an inhibitory activity on angiotensin I-converting enzyme, but substantially no inhibitory activity on thermolycin, pepsin and α-chymotrypsin,

(b) having a molecular weight of 1962 determined from fast atom bombardment spectrum,

(c) having a melting point in the range of 240° to 260° C. (decomposition),

(d) being composed of 17 structural units of amino acid residues which are one residue of tryptophan, one residue of lysine; two residues of aspartic acid, one residue of serine, one residue of glutamic acid, three residues of threo-β-methyllanthionine, one residue of meso-lanthionine, one residue of proline, two residues of glycine, one residue of valine, one residue of luecine, one residue of phenylalanine and one residue of dehydroalanine as its constituents, and

(e) having an infrared absorption spectrum with potassium bromide tablet as shown in FIG. 1 of the attached drawings and an aqueous solution of 1.122 mg of said enzyme inhibitor IS83 in 10 ml of water having an ultraviolet absorption spectrum as shown in FIG. 2 of the attached drawings.

4,526,867

PROCESS FOR PREPARING IMMOBILIZED MICROORGANISM

Ichiro Chibata, Suita; Tetsuya Tosa, Nishi, and Satoru Takamatsu, Yamada-Nishi, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Mar. 3, 1983, Ser. No. 471,850

Claims priority, application Japan, Mar. 19, 1982, 57-45457

Int. Cl.³ C12N *11/10, 11/12*

U.S. Cl. 435—178 **16 Claims**

1. A process for preparing an immobilized microorganism which comprises cultivating a microorganism in a culture broth, treating the broth with glutaraldehyde when cultivation is completed, collecting microbial cells from the broth, admixing the microbial cells with an aqueous solution of a polysaccharide having 10 w/w % or more of sulfate moiety in the molecule thereof and then gelling the polysaccharide in the resulting mixture to entrap the microbial cells within the gel matrix of the polysaccharide.

14. An immobilized microorganism which is prepared by the process comprising the steps of: cultivating a microorganism in a culture broth, treating the broth with glutaraldehyde when cultivation is completed, collecting microbial cells from the broth, admixing the microbial cells with an aqueous solution of a polysaccharide having 10 w/w % or more of sulfate moiety in the molecule thereof and then gelling the polysaccharide in

the resulting mixture to entrap the microbial cells within the gel matrix of the polysaccharide.

4,526,868

RENNET SUBSTITUTE FROM SEALS FOR MAKING CHEESE

Kazi M. Shasuzzaman, 74 Fox Ave., St. John's, Newfoundland, Canada (A1B 2J2), and Norman F. Haard, Marine Dr., Outer Cove, Newfoundland, Canada

Filed Oct. 12, 1982, Ser. No. 433,936

Claims priority, application Switzerland, Oct. 22, 1981, 388552

Int. Cl.³ C12N *9/64*; A23C *19/04*

U.S. Cl. 435—226 **11 Claims**

1. A high potency calf rennet substitute preparation having enzymes extracted from the mucosa of the stomach of seals or from the whole stomach of seals comprising four seal calf rennet substitute, said proteolytic enzyme components having a good milk clotting efficiency over a wide range of pH of 6.0 to 6.8, a high ratio of milk clotting to proteolytic activity, relative inability to inactivate ribonuclease and limited hydrolysis of casein, and having a potency of up to 80 rennin units per millimeter thereof when tested in reconstituted skim milk at a pH 6.3 at 30° C., said four, proteolytic enzyme components having four isoelectric points at 4.9, 4,3, 3.8 and 3.4.

4,526,869

METHOD FOR QUANTITATIVELY DETERMINING THE CONCENTRATION OF HEMOGLOBIN IN A BIOLOGICAL SAMPLE

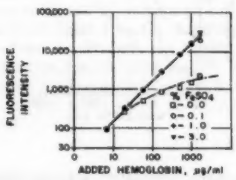
Samuel Schwartz, St. Louis Park, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 190,399, Sep. 24, 1980, Pat. No. 4,378,971. This application Mar. 31, 1983, Ser. No. 480,871

The portion of the term of this patent subsequent to Apr. 5, 2000, has been disclaimed.

Int. Cl.³ G01N *21/64, 33/52, 33/72*

U.S. Cl. 436—66 **20 Claims**



1. A method of quantitatively determining the amount of hemoglobin in feces, urine or gastric juices comprising the steps of:

preparing a test sample of feces, urine or gastric juices;

converting hemoglobin in said test sample to porphyrin by combining said test sample with an acidic converting reagent, said converting reagent being selected from the group of converting reagents having a reducing capacity sufficient to convert the hemoglobin in said test sample to porphyrin so that said conversion is substantially linear for concentrations of hemoglobin as high as 40 micrograms of hemoglobin per milliliter; and

determining the level of porphyrin in said test sample.

4,526,870

DETERMINATION OF NITRATE IN WATER AND CATALYST THEREIN

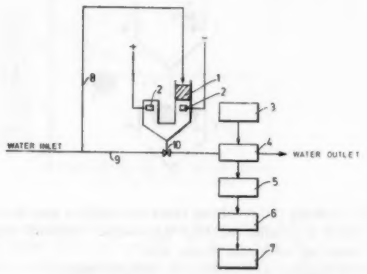
Heinz-Joachim Müller, Augsburg, Fed. Rep. of Germany, assignor to Kleindienst Aquatec GmbH & Co. KG, Fed. Rep. of Germany

Division of Ser. No. 416,267, Sep. 9, 1982, abandoned. This application Aug. 26, 1983, Ser. No. 526,510

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1981, 3136363

Int. Cl.³ G01N *21/75, 33/18*

U.S. Cl. 436—110 **24 Claims**



1. A method of determining nitrate in water comprising:

dividing a nitrate containing water sample into first and second portions;

reacting the first portion with gaseous hydrogen in the presence of a catalyst at a temperature of 5°–30° C. until the absorption caused by the nitrate in the ultraviolet spectrum at 210 nm has disappeared, the catalyst being the product of the reduction of a solution of a compound of a transition metal of the platinum group and a compound of a transition metal of the copper group in the presence of an acid, the catalyst containing the transition metal of the platinum group and the transition metal of the copper group in a molar ratio in the range from 1:8 to 8:1, whereby the nitrate is selectively reduced without the other entities present in the water being reduced at the same time; and

comparing the extinction of the second portion with the extinction of the reacted first portion at 210 nm in the ultraviolet range.

4,526,871

CONJUGATE OBTAINED BY COUPLING A LECTIN AND A SPECIFIC LIGAND, CONTAINING SUCH A CONJUGATE AND ITS APPLICATIONS IN BIOLOGY

Stratis Avrameas, La Celle Saint Cloud, and Jean-Luc Guesdon, Paris, both of France, assignors to Institut Pasteur, Paris, France

Filed May 20, 1981, Ser. No. 265,427

Claims priority, application France, May 22, 1980, 80 11470; Switzerland, Jul. 15, 1980, 5428/80

Int. Cl.³ G01N *33/54, 33/58, 33/60*

U.S. Cl. 436—504 **8 Claims**

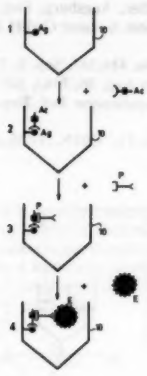
1. A process for the immunological assay of a biological substance, which comprises the steps of:

(1) immobilizing a substance having a binding affinity for said biological substance to be determined;

(2) incubating said substance with a medium containing said biological substance to be determined;

(3) incubating, after washing, the resulting reaction medium with a conjugate of a lectin-specific ligand in solution in an aqueous medium containing an excess of a sugar specific to lectin, said ligand being capable of reacting specifically with said substance having an affinity to the biologi-

cal substance to be determined or with said biological substance itself;



(4) washing the resulting reaction medium and incubating it with a labeller bearing glycosidic fractions capable of reacting with said lectin; and

(5) revealing said labeller by suitable means.

4,526,872

TRANSPARENT GLASS-CERAMIC OF LIGHT BROWN COLOR AND METHOD OF MAKING

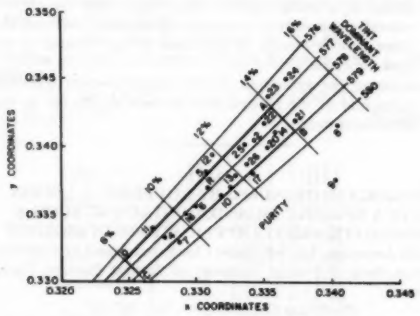
Andre Andrieu, Nemours; Jean-Pierre P. Davot, and Jean-Pierre A. M. Thibieroz, both of Avon, all of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1984, Ser. No. 582,277

Claims priority, application France, May 6, 1983, 83 07595; Jan. 11, 1984, 8400349

Int. Cl.³ C03C *3/22, 3/04*

U.S. Cl. 501—4 **4 Claims**



1. A transparent glass-ceramic article wherein β-quartz solid solution constitutes the predominant crystal phase exhibiting a light brown tint perceived by the human eye as essentially constant when the dominant wave length lies between 577–581 nm, the purity between 8–15%, and the transmission faction between 65–80, consisting essentially, expressed in terms of weight percent on the oxide basis, of about

SiO_2	62–70	TiO_2	1.8–6
Al_2O_3	17.75–21.5	Fe_2O_3	0–0.25
MgO	1–2.5	As_2O_3	0–1
ZnO	0.5–6	CoO	0.001–0.01
Li_2O	2.5–3.5	Cr_2O_3	0.001–0.01
BaO	0–2	CoO + Cr_2O_3	0.0025–0.02
ZrO_2	1–2.5		

wherein the sum of alkali metal oxides other than Li_2O and alkaline earth metal oxides rather than BaO does not exceed about 0.5%.

3. A opaque glass-ceramic article wherein β-spodumene solid solution constitutes the predominant crystal phase, exhibiting a light, warm creamy color perceived by the human eye as essentially constant when the dominant wave length lies between 570–585 nm, the reflectance factor is in excess of 64, and the purity no greater than 8%, consisting essentially, expressed in terms of weight percent on the oxide basis, of about

SiO_2	62–70	TiO_2	1.8–6
Al_2O_3	17.75–21.5	Fe_2O_3	0–0.25
MgO	1–2.5	As_2O_3	0–1
ZnO	0.5–6	CoO	0.001–0.01
Li_2O	2.5–3.5	Cr_2O_3	0.001–0.01
BaO	0–2	CoO + Cr_2O_3	0.0025–0.02
ZrO_2	1–2.5		

wherein the sum of alkali metal oxides other than Li_2O and alkaline earth metal oxides other than BaO does not exceed about 0.5%.

4,526,873

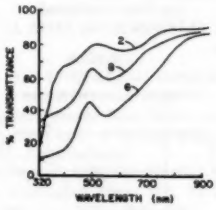
TRANSPARENT, MULLITE GLASS-CERAMICS CONTAINING ZNO AND METHOD

George H. Beall, Big Flats; Nicholas F. Borrelli, Elmira, and David L. Morse, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 2, 1984, Ser. No. 627,073

Int. Cl.³ C03C *3/22;* **C09K** *11/10*

U.S. Cl. 501—5 **5 Claims**



1. In a substantially transparent glass-ceramic article containing mullite as the predominant crystal phase and consisting essentially, expressed in terms of weight percent on the oxide basis, of 10–70% SiO_2, 7–40% B_2O_3, 14–50% Al_2O_3, at least one each of RO and R_2O, wherein the mole ratio Al_2O_3:-$RO+R_2O>1.3$, the glass-ceramic further containing 0.01–1.0% Cr_2O_3, whereby the glass-ceramic demonstrates a broad absorption over the visible region of the radiation spectrum with absorption peaks centered at about 400 and 600 nm and exhibits strong fluorescence in the red and near infrared portions of the spectrum when activated by ultra-violet and/or visible radiation, the improvement comprising RO content of 2 up to about 15% ZnO in the composition, and ZnO+MgO content being at least 5%, to shift the absorption peak centered at about 600 nm toward the lower (blue) end of the spectrum.

4,526,874

OPTICAL LIGHT WEIGHT GLASS WITH A REFRACTIVE INDEX OF >1.70, AN ABBE INDEX OF >22 AND A DENSITY OF <3.5 G/CM^3

Danuta Grabowski geb. Marszalek, Wiesbaden; Ludwig Ross, Klein-Winternheim; Volkmar Geiler, Mainz-Finthen, and Karl Mennemann, Taunesstein, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Apr. 27, 1983, Ser. No. 488,951

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216451

Int. Cl.^{3} C03C *3/08, 3/10, 3/30*

U.S. Cl. 501—77 9 Claims

1. An optical glass having a refractive index of 1.74–1.79, an Abbe number of 25–29 and a density of 3.1–3.3 g/cm^3, with crystallization stability sufficiently good to enable the glass to be produced in 100 liter crucible melts and chemical stability characterized by having an acid resistance of >100 hrs. for removal of 0.1 μm, from a polished layer with 0.5N HNO_3 and an alkali resistance of >120 hrs. for removal of 0.1 μm from a polished layer with NaOH at pH 10, containing not more than 1.5 percent by weight ionic fluorine and not more than 2 percent by weight SnO_2, consisting essentially of the following composition, in percent by weight:

SiO_2	30–35
GeO_2	0–1
B_2O_3	0.5–3
Al_2O_3	0–2
Li_2O	0–3
Na_2O	7.5–13
K_2O	4–6
total alkali metal oxides	12–18
MgO	0–2
CaO	1–3
SrO	0–2
BaO	7–13
ZnO	0–2
total alkaline earth oxides	8–15
TiO_2	20–30
ZrO_2	0–3
Nb_2O_5	7–19 and
WO_3	0.2–2,

wherein the SiO_2:TiO_2 ratio is 1–1.75.

4,526,875

CERAMIC MATERIAL FOR CUTTING TOOLS AND PROCESS FOR THE PRODUCTION THEREOF

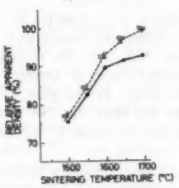
Yoshihiro Yamamoto, and Kenji Sakurai, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation of Ser. No. 386,369, Jun. 8, 1982, abandoned. This application Jan. 13, 1984, Ser. No. 569,943

Claims priority, application Japan, Jun. 8, 1981, 56-87711

Int. Cl.^{3} C04B *35/10, 35/52, 35/58*

U.S. Cl. 501—87 3 Claims



1. A ceramic material of high strength and sufficient thermal conductivity for a cutting tool consisting essentially of a sintered molded powder mixture consisting essentially of (a) Al_2O_3, (b) TiN, and (c) at least one of ZrC, Zr, and ZrN, wherein component (a) constitutes between 25 and 65% of the total volume of the powder mixture and the volume ratio of component (c) to component (b) is ½ or less.

4,526,876

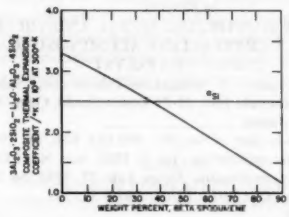
MULLITE-BETA SPODUMENE COMPOSITE CERAMIC

James D. Hodge, Cohoes, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 30, 1984, Ser. No. 634,768

Int. Cl.^{3} C04B *35/18*

U.S. Cl. 501—128 15 Claims



1. A process for producing a polycrystalline body comprised of from about 50% by weight to about 95% by weight of crystalline mullite phase and from about 5% by weight to about 50% by weight of crystalline beta spodumene phase which comprises providing a mixture comprised of mullite and/or beta spodumene and/or Al_2O_3 and/or SiO_2 and/or a precursor for Li_2O, said mixture having a composition required to produce said polycrystalline body, shaping said mixture into a compact, sintering said compact at a temperature ranging from greater than 1423° C. to about 1500° C. at which sufficient liquid phase is generated to liquid phase sinter the compact and produce a densified body having a density greater than about 85% of the theoretical density of said body, said sintering temperature having no significant deleterious effect on said compact or body, said sintered body containing said mullite phase and a glassy phase of beta spodumene, nucleation-annealing said sintered body at a temperature ranging from about 600° C. to about 800° C. to nucleate said glassy beta spodumene phase, crystallization-annealing the resulting nucleated body at a temperature ranging from about 1200° C. to below the temperature at which liquid forms in said body to produce said polycrystalline body, said sintering, said nucleation-annealing and said crystallization-annealing being carried out in an atmosphere or vacuum which has no significant deleterious effect on said compact or body, and said body does not contain a phase of silica.

7. A polycrystalline body comprised of crystalline mullite in an amount ranging from about 50% by weight to about 95% by weight of the total weight of the body and crystalline beta spodumene in an amount ranging from about 5% by weight to about 50% by weight of the total weight of the body, said body having a density greater than about 85% of the theoretical density of said body, and said body does not contain a phase of silica.

4,526,877

ATTRITION RESISTANT MOLECULAR SIEVE

Arun Acharya, East Amherst, and William E. BeVier, Kenmore, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 433,901, Oct. 12, 1982, abandoned. This application Sep. 28, 1984, Ser. No. 655,581

Int. Cl.^{3} B01J *20/18*

U.S. Cl. 502—60 21 Claims

1. A composition comprising a generally spherical, friable, high porosity molecular sieve particle, having an adherent surface comprising surface irregularities and, adhered to the exposed adherent surface of said particle, a thin, generally

uniform coating of a solid lubricant in an amount of from about 1.0×10^{-7} to 2.0×10^{-3} gram per square centimeter of the projected surface area of said particle.

6. The composition of claim 1 wherein said solid lubricant is graphite.

7. The composition of claim 1 wherein said solid lubricant is molybdenum disulfide.

8. The composition of claim 1 wherein said solid lubricant is polytetrafluoroethylene.

9. The composition of claim 1 wherein said solid lubricant is derived from activated carbon.

4,526,878

METHOD FOR SUPPORTING METAL AND/OR METAL OXIDE ON A CRYSTALLINE ALUMINOSILICATE ZEOLITE CATALYST

Yoshinobu Takegami, 5 Shugakuin-Takabe-cho, Sakyo-ku, Kyoto, and Tomoyuki Inui, 35-21 Koaza-Shodo, Oaza-Terada, Joyo, both of Japan

Continuation-in-part of Ser. No. 350,103, Feb. 18, 1982, abandoned. This application Oct. 3, 1983, Ser. No. 538,101
Claims priority, application Japan, Feb. 27, 1981, 56-27732
Int. Cl.³ B01J *29/06;* **C01B** *33/28*
U.S. Cl. 502—65 **1 Claim**

1. A process for producing a crystalline alumina-silicate zeolite comprising:

preparing from 80 to 99.55 weight percent of a zeolite synthesis reaction mixture having a molar ratio of oxides as follows:

SiO_2/Al_2O_3	8–70
OH^-/SiO_2	0.2–1.6
H_2O/SiO_2	10–30
M/SiO_2	0.2–1.7
R/SiO_2	0.0086–0.20
$R/M + R$	0.0005–0.40
K_2O/M_2O	0.05–0.3

wherein R represents a tetra alkyl ammonium cation, the alkyl radical being selected from the group consisting of methyl, ethyl and combination thereof and M is potassium or sodium cation; mixing from 0.45 to 20 weight percent of a crystal seed having a particle size between 0.05 and 10 microns, selected from the group consisting of α-alumina, kaolin and γalumina with said zeolite synthesis reaction mixture;

heating said mixture to a temperature of from 150 to 270 degrees C.;

maintaining said mixture at said temperature for a period of from 0.5 to 20 hours to form crystals;

further processing the obtained crystals by filtering, washing and drying; and calcining said crystals at a temperature of from 400 to 600 degrees C. for a period of from 0.5 to 5 hours;

wherein 0.5 to 12 weight percent of one or not less than two metals and/or metal oxides are deposited on said crystal seed on the weight basis of said crystal seed; and said metal and/or metal oxide are selected from the group consisting of Group 8 elements, rare earth elements, oxides of Group 8 elements, oxides of rare earth elements and combinations thereof.

4,526,879

SYNTHESIS OF ZEOLITE ZSM-5

Francis G. Dwyer, West Chester, Pa., and Pochen Chu, West Deptford, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 295,967, Aug. 25, 1981, abandoned, which is a continuation of Ser. No. 960,158, Nov. 13, 1978, abandoned. This application Aug. 5, 1983, Ser. No. 520,746
Int. Cl.³ C01B *33/28*
U.S. Cl. 502—71 **8 Claims**

1. A method for preparing ZSM-5 having a crystal size of from about 0.03 micron to about 20 microns and an alkali metal content ranging from about 0.01 to about 0.20 weight percent which method comprises preparing a mixture containing sources of an alkali metal oxide, an aluminum oxide, a silicon oxide and a combination of a C_1–C_6 primary alkylamine and a C_1–C_5 alkyl halide in a ratio of amine to halide of from about 2:1 to about 10:1, and a solvent, said mixture having a composition, in mole ratios of oxides, within the following ranges:

SiO_2/Al_2O_3	10–500
H_2O/SiO_2	10–100
M/SiO_2	0.1–2.0
R/SiO_2	0.05–1.0

wherein R represents the radical or mixture of radicals obtained from the association of said C_1–C_6 alkyl amine and said C_1–C_6 alkyl halide and M is an alkali metal or an alkaline earth cation, and reacting said mixture at from about 100° F. to about 350° F. until ZSM-5 crystallization is complete.

4,526,880

HYDROTHERMAL ZEOLITE ACTIVATION

Pochen Chu, West Deptford, and Günter H. Kühl, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 16, 1984, Ser. No. 631,689
Int. Cl.³ B01J *29/28*
U.S. Cl. 502—71 **18 Claims**

1. An improved method for enhancing the catalytic activity of a composition consisting essentially of crystals of a high silica content crystalline zeolite that contains from about 0.1 wt % to about 2.5 wt % of framework boron, said crystals having a silica to alumina ratio of at least 100, which method comprises:

treating said crystals with water under conditions effective to hydrolyze from about 10% to about 95% of said boron;

compositing under hydrous conditions said treated crystals with fine particles of an alumina-containing material whereby said catalytic activity is increased; and

recovering said composited treated crystals of enhanced catalytic activity.

4,526,881

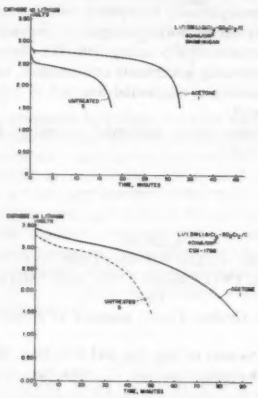
METHOD OF PRETREATING CARBON BLACK POWDER TO IMPROVE CATHODE PERFORMANCE AND LITHIUM SULFURYL CHLORIDE CELL INCLUDING THE PRETREATED CARBON BLACK POWDER

Michael Binder, Brooklyn, N.Y.; Charles W. Walker, Jr., Freehold, N.J.; Eric R. Petersen, Manchester, N.J.; William L. Wade, Jr., Neptune, N.J., and Sol Gilman, Rumson, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 24, 1983, Ser. No. 544,770
Int. Cl.³ B01J *21/18;* **C01B** *31/02;* **H01M** *6/14*
U.S. Cl. 502—101 **6 Claims**

1. Method of pretreating a carbon black powder prior to cathode fabrication to improve cathode operating voltages and increase cathode life, said method comprising wetting the carbon black powder with acetone, filtering the carbon black-acetone mixture through a Buchner funnel fitted with a filter paper, rinsing with an excess of water and drying overnight in a vacuum oven at about 100° C.

2. Method according to claim 1 wherein the carbon black powder is a low surface area carbon black powder.



3. Method according to claim 1 wherein the carbon black powder is a high surface area carbon black powder.

4,526,882

MIXED ESTER RETREATED PROPYLENE POLYMERIZATION CATALYST

Bryce V. Johnson, Elburn; Nicholas M. Karayannis, and John S. Skryantz, both of Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 24, 1983, Ser. No. 544,544
Int. Cl.³ C08F *4/64*
U.S. Cl. 502—105 **20 Claims**

10. A process for preparing a catalyst component useful in polymerization of alpha-olefins comprising:

(A) contacting components comprising (1) at least one magnesium alcoholate, and (2) at least one Group II or IIIA metal alkyl in amounts such that the atomic ratio of metal in (2) to metal in (1) ranges from about 0.001:1 to about 1:1;

(B) removing unreacted Group II or IIIA metal component from the product of (A) to form a solid, hydrocarbon-insoluble, magnesium-containing pretreatment product;

(C) contacting said pretreatment product with components comprising at least one titanium(IV) halide or haloalcoholate and at least one organic electron donor containing at least one of oxygen, nitrogen, sulfur or phosphorus, in amounts such that the atomic ratio of titanium to metal in (A)(1) is at least about 0.5:1 and the ratio of organic electron donor to titanium ranges from about 0.001 to about 1 mole per gram-atom, to form a solid catalyst component;

(D) comminuting the resulting product; and

(E) retreating the comminuted product by contacting such product with components comprising at least one titanium(IV) halide or haloalcoholate and a mixture containing about 30 to about 70 mole percent ethyl benzoate and about 70 to about 30 mole percent of at least one para-substituted alkyl carboxylic aromatic acid ester in which the substituent group has a negative Hammett constant in amounts such that the atomic ratio of retreatment titanium to titanium contained in the comminuted product is about 50:1 to about 500:1 and the ratio of moles of organic acid ester to gram-atom of titanium contained in the comminuted product is about 0.5:1 to about 10:1.

4,526,883

OLEFIN POLYMERIZATION CATALYST ACTIVITY BY SIMULTANEOUS OLEFIN WASHING AND ADDITION OF ELECTRON DONOR

Charles K. Buehler, Naperville, Ill., assignor to Northern Petrochemical Company, Omaha, Nebr.

Filed Jun. 20, 1984, Ser. No. 622,471
The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.
Int. Cl.³ C08F *4/64*
U.S. Cl. 502—108 **6 Claims**

1. A method for increasing the productivity of an olefin polymerization catalyst containing an aluminum chloride co-crystallized titanium halide which comprises simultaneously washing the modified titanium halide with an olefin and adding electron donor containing an ester group to the catalyst component.

4,526,884

RUTHENIUM CONTAINING CATALYST COMPOSITION USEFUL FOR PROCESS FOR THE DEMERIZATION OF ACRYLIC COMPOUNDS

Dean T. Tsou, Solon; James D. Burrington, Richmond Hts.; Elizabeth A. Maher, University Hts., and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 27, 1982, Ser. No. 453,410
Int. Cl.³ B01J *31/06*
U.S. Cl. 502—154 **21 Claims**

1. A catalyst composition comprising an organic polymer catalyst support, trivalent pendant atoms covalently bonded to the support, ruthenium complexed with said trivalent pendant atoms, and a second metal, wherein the second metal is at least one of Pb, Co, Fe and Ni and is disposed on the organic polymer catalyst support.

3. The catalyst of claim 1 wherein the ruthenium is in the form of a complex represented by the formula:

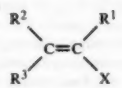
$$RuL_a^1L_b^2L_c^3$$

wherein

L^1 is a mono or bidentate ligand selected from F, Cl, Br, I, 2,4-pentanedionate, or mixtures thereof,

wherein

L^2 is one or more of acrylonitrile, methacrylonitrile, acetonitrile, propionitrile, benzonitrile, water and a group of the formula:



wherein X is CN, CO_2R^4, CHO or $CONR_2^4$ and R^1, R^2, R^3 and R^4 are independently selected from $C_{1\text{-}16}$ alkyl, $C_{1\text{-}16}$ aryl and H;

wherein

L^3 is R_3^5P, R_3^5As, R_3^5Sb, R_3^6N and R_2^6O, or mixtures thereof wherein each R^5 is a $C_{1\text{-}16}$ group independently selected from alkyl, aryl, alkoxy, aryloxy, dialkylamino and diarylamino and R^6 is independently selected from $C_{1\text{-}16}$ alkyl, $C_{1\text{-}16}$ aryl or H; and

wherein

a is 0 to 3;

b is 0 to 6;

c is 0 to 6; and

a+b+c is at least 2; and

wherein

L^1, L^2 and L^3 are additively bonded to the Ru with 4 to 6 ligating bonds.

4,526,885

CATALYST SUPPORTS AND HYDROCARBON CONVERSION PROCESSES EMPLOYING CATALYSTS BASED ON THESE SUPPORTS

Michael A. Day, and Alistair Reid, both of Cleveland, England, assignors to Imperial Chemical Industries Plc, London, England

Filed Jan. 26, 1984, Ser. No. 574,244

Claims priority, application United Kingdom, Feb. 9, 1983, 8303574

Int. Cl.[3] B01J *21/02, 21/06*

U.S. Cl. 502—327 10 Claims

1. A catalyst support which comprises a porous gel of an inorganic substance, the porous gel having been prepared by a "sol-gel" process, and in which the gel has a surface area in the range 125 to 150 m^2/g, a mean pore diameter in the range 140 to 190Å with at least 80% of the pore volume contained in pores having a pore diameter size distribution in the range of 50 to 90Å.

4,526,886

CATALYST OF URANIUM, PLATINUM AND RHODIUM FOR CONVERTING CARBON MONOXIDE, HYDROCARBONS AND NITROGEN OXIDES

George C. Joy, III, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 332,402, Dec. 18, 1981, abandoned, which is a division of Ser. No. 176,831, Sep. 8, 1980, Pat. No. 4,323,542, which is a continuation-in-part of Ser. No. 52,647, Jun. 27, 1979, abandoned. This application May 6, 1983, Ser. No. 492,320

Int. Cl.[3] B01J *23/12, 23/42, 23/46*

U.S. Cl. 502—339 3 Claims

1. A catalytic composite comprising uranium, platinum and rhodium dispersed on a high surface area refractory inorganic oxide, wherein the uranium is present in at least a 50 wt. % amount based on the total amount of said metals.

4,526,887

CARBON MOLECULAR SIEVES AND A PROCESS FOR THEIR PREPARATION AND USE

Robert F. Sutt, Jr., Johnstown, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 475,797, Mar. 16, 1983, abandoned. This application Dec. 13, 1983, Ser. No. 561,005

Int. Cl.[3] C01B *31/00*

U.S. Cl. 502—420 18 Claims

9. A process for preparing carbon molecular sieves having average effective pore diameters of from about 3 to about 20 Angstroms which comprises continuously feeding an agglomerated naturally occurring carbonaceous substrate to a continuous transport type heating means and calcining said agglomerated substrate under non-activation conditions and under a purge of an inert gas at a rate of 1.2 to 9.2 feet/minute at a temperature range of about 250° to 1100° C. for at least 1 minute.

4,526,888

NEPHROTOXICITY INHIBITORS FOR AMINOGLYCOSIDE ANTIBIOTICS

Patricia D. Williams, Peterboro, and Girard H. Hottendorf, Manlius, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Apr. 29, 1983, Ser. No. 489,999

Int. Cl.[3] A61K *37/00, 31/70;* C07G *7/00;* C07C *103/52*

U.S. Cl. 514—12 23 Claims

1. An aminoglycoside composition having reduced nephrotoxicity, which comprises:

(a) an aminoglycoside, or pharmaceutically acceptable salt thereof, and

(b) at least 0.002 moles, per mole of aminoglycoside, of a member selected from the group consisting of

(i) polyasparagine,

(ii) polyaspartic acid or a pharmaceutically acceptable salt thereof,

(iii) a copolymer of polyasparagine and polyaspartic acid, or a pharmaceutically acceptable salt thereof, and

(iv) a copolymer of polyasparagine or polyaspartic acid, or a pharmaceutically acceptable sait thereof, with a pharmaceutically acceptable comonomer, said copolymer containing a substantial amount of asparagine or aspartic acid,

wherein the member has a molecular weight of from about 1000 to about 100,000.

4,526,889

EPIMERIC AZAHOMOERYTHROMYCIN A DERIVATIVE, INTERMEDIATES AND METHOD OF USE

Gene M. Bright, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 441,979, Nov. 15, 1982, abandoned. This application Apr. 17, 1984, Ser. No. 601,185

Int. Cl.[3] A61K *31/71;* C07H *17/08*

U.S. Cl. 514—29 18 Claims

1. 4"-Epi-9-deoxo-9a-methyl-9a-aza-9a-homoerythromycin A or a pharmaceutically-acceptable salt thereof.

3. A method of treating a bacterial infection in a mammal which comprises administering to said mammal an antibacterially effective amount of the compound of claim 1.

4,526,890

3,6,7,8-SUBSTITUTED-S-TRIAZOLO[4,3-b]PYRIDAZINES AS BRONCHODILATORS

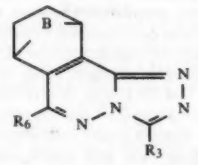
Norton P. Peet, and Shyam Sunder, both of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 89,071, Oct. 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 44,876, Jun. 4, 1979, abandoned, which is a continuation of Ser. No. 889,771, Mar. 24, 1978, abandoned, which is a continuation of Ser. No. 714,738, Aug. 16, 1976, abandoned, which is a continuation of Ser. No. 574,056, May 2, 1975, abandoned. This application Apr. 7, 1981, Ser. No. 251,794

Int. Cl.[3] C07D *487/04;* A61K *31/495, 31/535, 31/55*

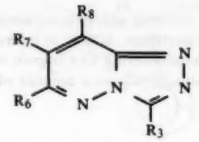
U.S. Cl. 514—248 22 Claims

1. A compound corresponding to the formula



wherein B represents methylene or ethylene; R_3 represents hydrogen or loweralkyl; R_6 represents amino, loweralkylamino, diloweralkylamino or heterocyclic amino or lower alkyl substituted heterocyclic amino, wherein the heterocyclic moiety forms a 5, 6, or 7 membered ring, having one or two ring nitrogen atoms and zero or one ring sulfur or oxygen atom; or a pharmacologically acceptable salt of said compound.

17. A method of alleviating bronchoconstriction in mammals comprising administering to a mammal an effective amount of a composition comprising an effective amount of a compound of the formula



wherein R_3 represents hydrogen or lower alkyl; R_6 represents amino, loweralkylamino, diloweralkylamino, or heterocyclic amino or lower alkyl substituted heterocyclic amino, wherein the heterocyclic moiety forms a 5, 6, or 7 membered ring, having one or two ring nitrogen atoms and zero or one ring sulfur or oxygen atom; and wherein R_7 and R_8 taken together independently represent polymethylene or substituted polymethylene of 4 methylene units substituted by loweralkyl, or by methano or ethano bridges; or a pharmacologically acceptable salt of said compound, in admixture with a pharmaceutically-acceptable carrier.

4,526,891

SUBSTITUTED ALKYL AMINE DERIVATIVES OF 6,11-DIHYDRO-11-OXODIBENZ[B,E]OXEPINS

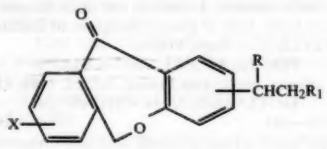
Lawrence L. Martin, Lebanon, and Linda L. Setescak, Somerville, both of N.J., assignors to Hoechst Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Mar. 10, 1983, Ser. No. 474,106

Int. Cl.[3] A61K *31/495;* **C07D** *405/06*

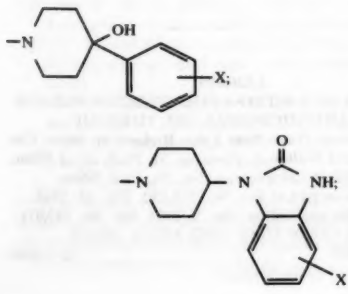
U.S. Cl. 514—253 **27 Claims**

19. A method of alleviating pain in a mammal which comprises administering to a mammal an effective pain alleviating amount of a compound of the formula

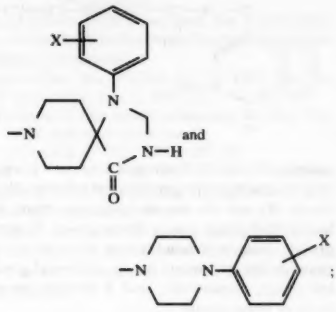


where X is hydrogen, halogen, lower alkoxy, lower alkyl, nitro amino, hydroxyl and CF_3; R is hydrogen, and lower alkyl, R_1 is

where R_2 and R_3 are the same or different and are hydrogen, lower alkyl, mesyl, and cycloalkylloweralkyl possessing a carbocyclic ring of 3 to 7 carbon atoms;



-continued



and the pharmaceutically acceptable acid addition salts thereof.

4,526,892

DIMETHYLAMINOALKYL-3-(ERGOLINE-8′βCARBONYL)-UREAS

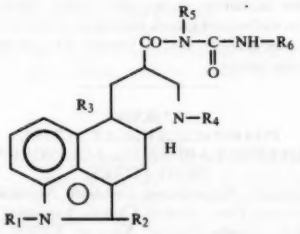
Patricia Salvati; Anna M. Caravaggi; Aldemio Temperilli; Germano Bosisio, all of Milan; Osvaldo Sapini, Gallarate, and Enrico di Salle, Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 249,995, Mar. 3, 1981,. This application Dec. 9, 1982, Ser. No. 448,364

Int. Cl.[3] C07D *457/06;* **A61K** *31/48*

U.S. Cl. 514—288 **4 Claims**

1. Compounds of formula



wherein R_1 is a hydrogen atom or a methyl group; R_2 is a hydrogen atom; R_3 is a hydrogen atom or a methoxy group; R_4 is an alkyl or an alkenyl group selected from methyl, allyl and propyl groups; and each of R_5 and R_6 independently is an alkyl group having from 1 to 3 carbon atoms or a group of the formula $(CH_2)_nN(CH_3)_2$ in which n is 3 with the proviso that at least one of R_5 and R_6 is said dimethylaminoalkyl group, and pharmaceutically acceptable addition salts with organic or inorganic acid thereof.

4,526,893

ISOCARBOSTYRIL DERIVATIVES

Toshihiro Takahashi; Noriyoshi Sueda; Masahiro Tsuji, all of Kawagoe; Yoshiyuki Tahara, Tsurugashima; Hiroyasu Koyama, Ageo; Yoshikuni Suzuki, Ohmiya; Masao Nagase, Kawagoe, and Toshiji Sugai, Kamifukuoka, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Japan

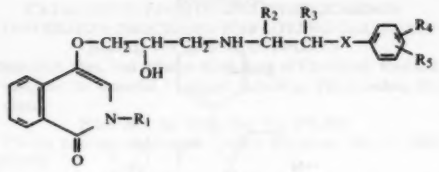
Filed Dec. 16, 1983, Ser. No. 562,237

Claims priority, application Japan, Dec. 24, 1982, 57-225996

Int. Cl.[3] A61K *31/47;* **C07D** *217/24*

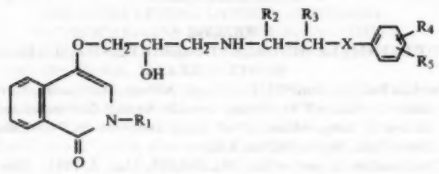
U.S. Cl. 514—309 **4 Claims**

1. Isocarbostyril derivative represented by the general formula



wherein R_1 denotes hydrogen atom or a lower alkyl group, R_2 and R_3 denote hydrogen atom or a lower alkyl group, respectively, R_4 and R_5 denote hydrogen atom, halogen atom, a lower alkyl group, lower alkoxy group, hydroxy group, amino group, lower acylamino group, nitro group, lower alkylmercapto group, carbamoyl group, sulfamoyl group or hydroxyalkyl group, respectively, and X denotes oxygen atom, sulfur atom or imino group.

4. A pharmaceutical composition which comprises as an active ingredient a compound of the general formula



wherein R_1 denotes hydrogen atom or a lower alkyl group, R_2 and R_3 denote hydrogen atom or a lower alkyl group, respectively, R_4 and R_5 denote hydrogen atom, halogen atom, a lower alkyl group, lower alkoxy group, hydroxy group, amino group, lower acylamino group, nitro group, lower alkylmercapto group, carbamoyl group, sulfamoyl group or hydroxyalkyl group, respectively, and X denotes oxygen atom, sulfur atom or imino group.

4,526,894

PHARMACEUTICALLY ACTIVE 4-HYDROXY-3-BENZOYL-2-QUINOLONE DERIVATIVES

Hiroshi Enomoto, Nagoakakyo; Tadatoshi Nomura, Uji; Yoshiaki Aoyagi, Otsu; Shoichi Chokai, Kameoka; Tatsuhiko Kono, Suita; Masao Murase, Kusatsu; Kichiro Inoue, Fushimi, and Masahiro Adachi, Hirakata, all of Japan, assignors to Nippon Shinyaku Co. Ltd., Japan

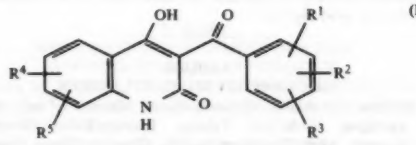
Filed Jun. 21, 1983, Ser. No. 506,503

Claims priority, application Japan, Jun. 21, 1982, 57-107366

Int. Cl.[3] A61K *31/47;* **C07D** *215/22*

U.S. Cl. 514—312 **15 Claims**

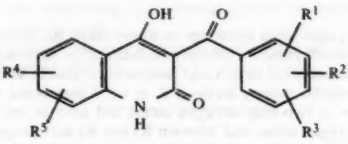
1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof wherein R^1, R^2 and R^3 are each hydrogen, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 5 carbon atoms, halo, nitro, cyano, halo lower alkyl of 1 to 3 carbon atoms or $COOR^6$ wherein R^6 is hydrogen or alkyl of 1 to 3 carbon atoms, and R^4 and R^5 are each hydrogen, alkyl of 1 to 8 carbon atoms, halo, nitro, cyano, halo lower alkyl of 1 to 3 carbon atoms or $COOR^6$ wherein R^6 is as above defined, provided that all of R^1, R^2, R^3, R^4 and R^5 are not simultaneously hydrogen.

9. A method of effecting anti-inflammatory, anti-allergenic, antitussive and expectorant action in humans and animals which comprises administering to a human or animal in need thereof a therapeutically effective amount of a compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof wherein R^1, R^2 and R^3 are each hydrogen, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 5 carbon atoms, halo, nitro, cyano, halo lower alkyl of 1 to 3 carbon atoms or $COOR^6$ wherein R^6 is hydrogen or alkyl of 1 to 3 carbon atoms, and R^4 and R^5 are each hydrogen, alkyl of 1 to 8 carbon atoms, halo, nitro, cyano, halo lower alkyl of 1 to 3 carbon atoms or $COOR^6$ wherein R^6 is as above defined, provided that all of R^1, R^2, R^3, R^4 and R^5 are not simultaneously hydrogen, in combination with a pharmaceutically acceptable carrier.

4,526,895

3-PYRIDYL-5-ALKOXY-PYRAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITION FOR USE AS A CARDIOTONIC MEDICATION

Francois-Xavier Jarreau, Versailles, and Jean-Jacques Koenig, Vernou la Celle, both of France, assignors to Etablissements NATIVELLE S.A., Paris, France

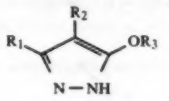
Filed Jul. 12, 1983, Ser. No. 513,190

Claims priority, application France, Jul. 12, 1982, 82 12176

Int. Cl.[3] A61K *31/44;* **C07D** *401/04*

U.S. Cl. 514—341 **10 Claims**

1. A 3-pyridyl-5-alkoxy-pyrazole derivative represented by the following formula (I):



(I)

wherein R_1 represents a 4-pyridyl, 3-pyridyl or 2-pyridyl group which is unsubstituted or which may be substituted with one or two lower alkyl groups; R_2 represents a hydrogen atom or a lower alkyl group; and R_3 represents a lower alkyl group, a phenyl group or an benzyl group; or a pharmaceutically acceptable acid addition salt thereof.

4,526,896

TETRAZOL-5-YL 2-NITRO-3-PHENYLBENZOFURANS AND ANTIMICROBIAL USE THEREOF

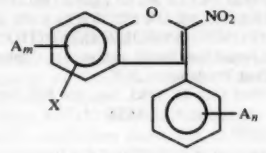
Robert A. Scherrer, White Bear Lake; Richard M. Stern, Cottage Grove, and Walton J. Hammar, St. Paul, all of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 973,150, Dec. 26, 1978, abandoned. This application Mar. 5, 1981, Ser. No. 240,871

Int. Cl.[3] A01N *43/64;* **C07D** *405/04, 405/06*

U.S. Cl. 514—252 **15 Claims**

1. A compound of the formula



wherein

A is BD—,

B is an unsubstituted tetrazole ring,

D is a carbon-carbon bond or methylene,

m and n are zero or one, the sum of m and n is one and

X is hydrogen, methyl or ethyl.

12. A method for arresting or inhibiting the growth of microorganisms comprising contacting said microorganisms with a compound according to claim **1** in an amount sufficient to inhibit the growth of said microorganisms.

4,526,897

HYPERTENSIVE ISOINDOLIN-2-YL-AMINOIMIDAZOLINES AND ISOINDOLIN-2-YL-GUANIDINES

Erich Cohnen, and Ben Armah, both of Hamburg, Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

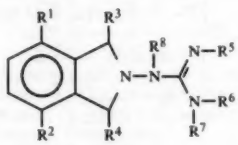
Filed Aug. 13, 1982, Ser. No. 407,972

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133302

Int. Cl.[3] **A61K** *31/415, 31/40;* **C07D** *403/12, 209/44*

U.S. Cl. 514—392 **16 Claims**

1. An isoindolin-2-yl-guanidine or an isoindolin-2-yl aminoimidazoline of the formula



(I)

in which

R^1 and R^2 can be identical or different and are either hydrogen or a halogen, alkyl, or alkoxy, each with 1 to 4 carbon atoms,

R^3 and R^4 can be identical or different and are either a hydrogen or an alkyl with 1 to 4 carbon atoms, and

R^5, R^6, R^7, and R^8 can be identical or different and are either hydrogen or an alkyl with 1 to 4 carbon atoms, or in which

R^5 and R^6 together represent the ethylene group, or a pharmaceutical by acceptable salt thereof, except for 2-(N-aminoisoindolinyl)-imidazoline and 4-chloro-2-(2-imidazolin-2-ylamino)-isoindoline.

15. A method for the treatment of hypotension in a warm-blooded animal requiring said treatment which comprises administering to said warm-blooded animal a hypertensively effective amount of a compound of claim **1** or a physiologically compatible acid-addition salt thereof.

4,526,898

ANTIHYPERTENSIVE 4-(2-IMIDAZOLIN-2-YL-AMINO)-2-METHYL-INDAZOLE

Istvan Molnar; Kurt Thiele; Felix Geissmann, and Ulrich Jahn, all of Zofingen, Switzerland, assignors to Siegfried Aktiengesselschaft, Zofingen, Switzerland

Continuation-in-part of Ser. No. 375,116, Apr. 28, 1982, Pat. No. 4,436,913. This application Sep. 7, 1983, Ser. No. 530,145

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.[3] **A61K** *31/415;* **C07D** *403/12*

U.S. Cl. 514—392 **3 Claims**

1. The compound 4-(2-imidazolin-2-yl-amino)-2-methyl-indazole or an acid addition salt thereof.

3. A pharmaceutical composition useful in treating hypertension comprising a therapeutically effective amount of a compound of claim **1** associated with a common liquid or solid diluent or carrier material.

4,526,899

EYE OINTMENT FORMULATION INCLUDING THE DISODIUM SALT OF 1,3-BIS(2-CARBOXYCHROMON-5-YLOXY)PROPAN-2-OL

Neil A. Stevenson, Nanpantan, England, assignor to Fisons plc, Ipswich, England

Filed Jun. 20, 1983, Ser. No. 505,984

Claims priority, application United Kingdom, Jul. 2, 1982, 82/19185

Int. Cl.[3] **A61K** *31/35*

U.S. Cl. 514—456 **6 Claims**

1. An ointment for topical administration to the eye of a mammal for treatment of allergic conditions comprising:

0.5 to 15%, by weight of the total composition, of the disodium salt of 1,3-bis(2-carboxychromon-5-yloxy)propan-2-ol, as active ingredient,

70 to 90% by weight of soft paraffin,

5 to 15% by weight of liquid paraffin, and

0.1 to 15% by weight of acetylated lanolin in which 40 to 100% of the available hydroxy groups have been acetylated.

4,526,900

7-OXABICYCLOHEPTANE SUBSTITUTED OXA PROSTAGLANDIN ANALOGS AND THEIR USE IN THE TREATMENT OF THROMBOLYTIC DISEASE

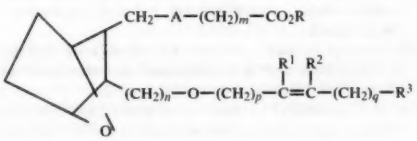
Steven E. Hall, Ewing Township, Mercer County, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 26, 1984, Ser. No. 574,000

Int. Cl.[3] **A61K** *31/557;* **C07D** *307/00*

U.S. Cl. 514—469 **21 Claims**

1. A compound having the structure formula



and including all stereoisomers thereof, wherein

A is —CH=CH— or —$(CH_2)_2$—;

m is 1 to 8; n is 1 to 4; p is 1 to 12; q is 0 to 5;

R is hydrogen, lower alkyl, hexenyl, alkali metal or tri(hydroxymethyl)aminomethane; R^1 and R^2 may be the same or different and are hydrogen or lower alkyl; and R^3 is hydrogen, lower alkyl, aryl or cycloalkyl; wherein the term lower alkyl or alkyl by itself or as part of another

group contains 1 to 12 carbons and is unsubstituted or substituted with halo, trifluoromethyl, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl or alkylcycloalkyl;

the term aryl by itself or as part of another group contains 6 to 10 carbons and is unsubstituted or substituted with lower alkyl, halogen or lower alkoxy;

the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups; and $(CH_2)_m$, $(CH_2)_n$, $(CH_2)_p$ and $(CH_2)_q$ may be unsubstituted or include one or more alkyl substituents.

14. A method of inhibiting platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim **1** or a pharmaceutically acceptable salt thereof.

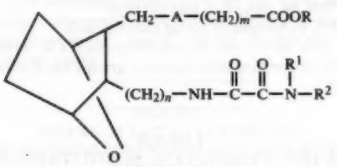
4,526,901

7-OXABICYCLOHEPTANE SUBSTITUTED OXAMIDE PROSTAGLANDIN ANALOGS AND THEIR USE IN TREATING THROMBOLYTIC DISEASE

Masami Nakane, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 26, 1984, Ser. No. 573,992
Int. Cl.³ A61K *31/557*; **C07D** *307/00*
U.S. Cl. 514—469 **11 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof wherein

A is —CH=CH— or $-(CH_2)_2-$;

m is 1 to 8; n is 1 to 5;

R is hydrogen, lower alkyl or alkali metal;

R^1 and R^2 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, aryl, aralkyl and cycloalkyl, wherein the term lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons and is unsubstituted or substituted with halo, trifluoromethyl, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl or alkylcycloalkyl;

the term aryl by itself or as part of another group contains 6 to 10 carbons and is unsubstituted or substituted with lower alkyl, halogen or lower alkoxy;

the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups, and the terms $(CH_2)_m$ and $(CH_2)_n$ may be unsubstituted or include one or more lower alkyl substituents.

7. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim **1** or a pharmaceutically acceptable salt thereof.

4,526,902

COMBINED FATTY ACID COMPOSITION FOR TREATMENT OR PROPHYLAXIS OF THROMBO-EMBOLIC CONDITIONS

David Rubin, Jerusalem, Israel, assignor to Century Laboratories, Inc., Port Washington, N.Y.

Filed Oct. 24, 1983, Ser. No. 545,349
Int. Cl.³ A61K *31/23*
U.S. Cl. 514—560 **9 Claims**

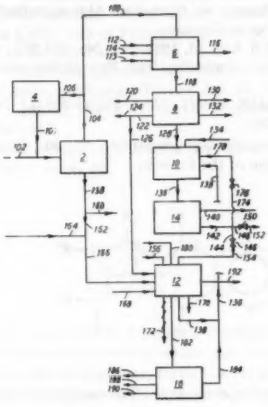
1. A pharmaceutical composition for treatment or prophylaxis of thrombo-embolic conditions consisting essentially of an effective amount of a combination of a first component selected from the group consisting of 5, 8, 11, 14, 17-eicosapentaenoic acid, 22:6 ω 3-docosahexaenoic acid and a combination thereof, and a second component selected from the group consisting of linoleic acid, γ-linolenic acid, dihomo-γ-linolenic acid and combinations thereof, said first and second components being present in relative amounts of 3:1 to 1:3.

4,526,903

PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS FROM COAL

Donald R. Cummings, Sydney, Australia, assignor to Dut Pty Limited, Burradoo, Australia

Filed Jan. 12, 1982, Ser. No. 339,007
Claims priority, application United Kingdom, Jan. 23, 1981, 8102010
The portion of the term of this patent subsequent to Jul. 26, 2000, has been disclaimed.
Int. Cl.³ C10K *3/04*; **C07C** *29/15*
U.S. Cl. 518—704 **15 Claims**



1. A process for the production of synthesis gas from coal comprising the steps of

(a) dividing lump coal suitable for counter-current gasification from a coal supply comprising such coal and fines;

(b) performing counter-current gasification of lump coal divided from the coal supply at superatmospheric pressure to form a gas comprising hydrogen and oxides of carbon and also containing methane values; and

(c) subsequently steam reforming at least a portion of said methane values in a reactor at least partially immersed in a fluidized bed of finely divided solid; wherein at least some of the heat for the steam reforming step is provided by heating the fluidized bed by combustion of fines divided from the lump coal as a result of the first step.

4,526,904

METHOD OF REGENERATING CATION EXCHANGE MEMBRANE BY TREATMENT WITH STRONG ACID AT ABOVE 110° C.

Konosuke Kishida, and Masaru Hirokawa, both of Kitaibaraki, Japan, assignors to Kabushiki Kaisha Musashino Kagaku Kenkyusho, Tokyo, Japan

Filed Jul. 15, 1983, Ser. No. 514,022
Claims priority, application Japan, Jul. 23, 1982, 57-127729
Int. Cl.³ C08D *5/20*
U.S. Cl. 521—26 7 Claims

1. A method for regenerating a perfluorinated cation exchange polymer membrane which can give only a low current efficiency as a result of being used as a diaphragm in an electrolytic cell or an electrodialyzer, said method comprising maintaining said perfluorinated cation exchange polymer membrane at a temperature of at least 110° C. while keeping it in contact with an aqueous solution of a strong acid having a pH at ordinary temperature of not more than 1.0 and wherein the current efficiency is increased to at least about 84%.

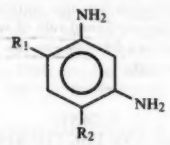
4,526,905

POLYURETHANES FROM DIALKYL DIAMINOBENZENES AND PROCESSES THEREFOR

Donald H. Lucast, St. Paul, Minn.; Ronald L. Shubkin, Baton Rouge, La.; Allen H. Filbey, Baton Rouge, La., and John C. Wollensak, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 395,125, Jul. 6, 1982, abandoned.
This application May 23, 1984, Ser. No. 612,965
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—51 32 Claims

1. A polyurethane formed from an organic polyol, an organic polyisocyanate, and a 4,6-dialkyl-m-phenylenediamine chain extender of structure:



wherein R_1 is a C_1–C_6 alkyl or C_3–C_6 cycloalkyl and R_2 is a C_2–C_6 alkyl or C_3–C_6 cycloalkyl.

4,526,906

NON-BURNING, NON-DRIPPING INSTANT SET MICROCELLULAR POLYURETHANES

Gunter H. Wegner, Charlotte, N.C., assignor to Wegner Development Company, Phoenix, Ariz.

Filed Sep. 6, 1983, Ser. No. 529,844
Int. Cl.³ C08G *18/14, 18/48*
U.S. Cl. 521—107 18 Claims

1. A non-burning, non-dripping instant set microcellular polyurethane comprising a polyisocyanate or polyisocyanate prepolymer reacted with a low molecular weight polyether polyol that has been blended with a non-reactive liquid modifier, and a flame retardant blend of an organophosphorus plasticizer and a polybrominated polyol in a sufficient quantity to provide desired flame retardancy in said polyurethane.

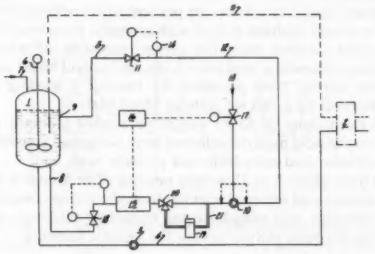
11. A non-burning, non-dripping instant set microcellular polyurethane comprising a polyisocyanate or polyisocyanate prepolymer reacted with a low molecular weight polyether polyol that has been blended with a non-reactive liquid modifier, and a flame retardant blend of an organophosphorus plasticizer and a polybrominated polyol in a sufficient quantity to provide desired flame retardancy in said polyurethane and characterized further by a minor amount of an adsorbent molecular sieve made from natural or synthetic crystalline alkali-metal alumino-silicates of the zeolite type, which is added in a sufficient quantity to impart effective char formation in said polyurethane.

4,526,907

PROCESS AND DEVICE FOR THE PREPARATION OF A REACTION MIXTURE OF AT LEAST TWO COMPONENTS FOR THE PRODUCTION OF FOAMS

Heino Thiele, Ludwigshafen; Werner Weber, Mannheim, and Peter Taubenmann, Munich, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 607,187
Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316787
Int. Cl.³ C08G *18/14, 18/08;* B67D *5/14;* C08F *6/00*
U.S. Cl. 521—133 4 Claims



1. A process for the preparation of a reaction mixture from at least two liquid reaction components for the production of plastic foams wherein said components are delivered separately from individual feed tanks to a mixing zone and mixed for reaction, and wherein further, at least one of said components is charged with a chemically inert gas in a recycle circuit having a compression zone which is maintained at a higher pressure than that of the feed tank, said gas being admixed with the reaction component at the point of initiation of the compression zone and said higher pressure being relieved through a throttle element prior to return of the gas-charged liquid to the feed tank.

4,526,908

POLYOL BLENDS OF PHTHALATE/TRIMELLITATE ESTERS FOR POLYURETHANE-POLYISOCYANURATE FOAMS

George Magnus, Arlington Heights; Norman Smith, Lake Forrest, and Bonnie Keyes, Chicago, all of Ill., assignors to Stepan Company, Northfield, Ill.

Continuation-in-part of Ser. No. 541,928, Oct. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 381,299, May 24, 1982, abandoned. This application Jun. 14, 1984, Ser. No. 619,134
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—172 13 Claims

1. A homogeneous liquid polyol blend composition comprising on a 100 weight percent total blend basis: (A) from about 2 to 25 weight percent of at least one aliphatic polyol of the generic formula:

$$HO—R^1—OH \quad (I)$$

wherein

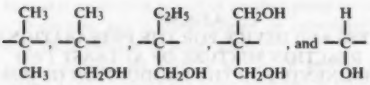
R^1 is a divalent radical selected from the group consisting of:

(a) alkylene radicals each containing from two through six carbon atoms,

(b) radicals of the formula:

$$—CH_2—R^2—CH_2—$$

R^2 is a radical selected from the group consisting of:



(c) radicals of the formula:

$$-(R^3O)_n-R^3-$$

R^3 is an alkylene radical containing from 2 through 3 carbon atoms and n is an integer of from 1 through 3,

(B) from about 50 to 95 weight percent of phthalate condensates of said aliphatic polyol with aromatic dicarboxylic acid material selected from the group consisting of phthalic acid and phthalic acid anhydride, and

(C) from about 5 to 35 weight percent of trimellitate condensates of said aliphatic polyol with aromatic tricarboxylic acid material selected from the group consisting of trimellitic acid and trimellitic acid anhydride, said polyol blend composition having been prepared by heating a starting blend comprised on a 100 wt % total blend basis of

(A) from about 50 to 95 weight percent of aromatic dicarboxylic acid material selected from the group consisting of phthalic acid anhydride and phthalic acid; and

(B) from about 5 to 35 weight percent of an aromatic tricarboxylic acid material selected from the group consisting of trimellitic acid anhydride and trimellitic acid with at least one aliphatic polyol having the generic formula:

$$HO-R^1-OH$$

wherein R^1 is as above defined, the initial mole ratio of said aliphatic polyol to said blend being in the range from about 1.9 to 4, said heating being conducted under liquid phase conditions at a temperature ranging from about 150° to 270° C. until the resulting product mixture reaches an hydroxyl number in the range from about 190 to 600 and an acid number in the range from about 0.01 to 7.

4,526,909

POLYMETHYLMETHACRYLATE DELIVERY SYSTEM FOR BONE MORPHOGENETIC PROTEIN

Marshall R. Urist, Pacific Palisades, Calif., assignor to Regents of the University of California, Berkeley, Calif.

Filed Jan. 9, 1984, Ser. No. 569,031

Int. Cl.³ A61K *35/12, 37/00;* **A01N** *63/02*

U.S. Cl. 523—115 **10 Claims**

1. A composition comprising substantially pure bone morphogenetic protein and a polymeric acrylic ester.

4,526,910

HIGH-SOLIDS COATING COMPOSITION FOR IMPROVED RHEOLOGY CONTROL CONTAINING INORGANIC MICROPARTICLES

Suryya K. Das, Pittsburgh; Paul P. Greigger, Allison Park; William G. Boberski, Gibsonia; James E. Jones, Lower Burrell; Raymond F. Schappert, Glenshaw, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 6, 1983, Ser. No. 529,312

Int. Cl.³ C08K *3/36*

U.S. Cl. 523—220 **25 Claims**

1. As essentially solvent-based, organic, high solids coating composition which is conventionally sprayable at high-solids comprising:

(A) a film-forming binder system containing a crosslinkable resin having a weight average molecular weight of from about 500 to about 10,000, and optionally a crosslinking agent for the crosslinkable resin;

(B) substantially colorless, substantially inorganic microparticles stably dispersed in the coating composition, the microparticles prior to incorporation in the coating composition ranging in size from about 1 to about 150 nanometers and in the form of a sol of the microparticles in which the surface of the inorganic microparticles is essentially free of carbon-containing molecules chemically bonded to the inorganic microparticles; and

(C) a solvent system for the crosslinkable resin and the optional crosslinking agent;

wherein the crosslinkable resin is in an amount of from about 15 to about 95 percent by weight and the substantially inorganic microparticles are in an amount of from about 1 to about 20 percent by weight, based on the sum of the weights of the crosslinkable resin, the optional crosslinking agent, and the inorganic microparticles.

4,526,911

ALUMINUM CELL CATHODE COATING COMPOSITION

Larry G. Boxall; William M. Buchta; Arthur V. Cooke, all of Baltimore; Dennis C. Nagle, Catonsville, and Douglas W. Townsend, Glen Burnie, all of Md., assignors to Martin Marietta Aluminum Inc., Bethesda, Md.

Filed Jul. 22, 1982, Ser. No. 400,772

Int. Cl.³ C08K *3/04;* **C08L** *63/00*

U.S. Cl. 523—445 **31 Claims**

5. A coating composition comprising from about 10 to about 90 percent Refractory Hard Material, from about 3 to about 80 percent non-graphitizing thermosetting resinous binder system, from about 1 to about 60 percent carbonaceous filler having a particle size less than 100 mesh, and up to about 70 percent carbonaceous additive having a particle size between about −4 mesh and +100 mesh, wherein said thermosetting binder system exhibits a char yield greater than 25 percent, and said binder system, carbonaceous filler, and carbonaceous additive exhibit an ablation rate after curing and carbonization essentially equal to the combined rate of wear and dissolution of said Refractory Hard Material in the environment of an aluminum reduction cell.

4,526,912

PHENOXY RESINS AND USE THEREOF IN ELECTRIC INSULATION

Luciano Biorcio, and Carlo Mensi, both of Alessandria, Italy, assignors to The P. D. George Co., St. Louis, Mo. and Industrie Vernici Italiane S.p.A., Milan, Italy

Filed Dec. 1, 1983, Ser. No. 556,981

Claims priority, application Italy, Feb. 16, 1983, 19614 A/83

Int. Cl.³ C08L *63/02*

U.S. Cl. 523—456 **19 Claims**

1. A composition comprising at least one organic solvent and a mixture of resins consisting essentially of (1) a phenoxy resin and (2) at least two resin components selected from the group consisting of (a) phenolic resins, (b) melamine resins and (c) polyisocyanates.

4,526,913

DIMER POLYMERIC COATING SELECTIVELY STRIPPABLE AS COHESIVE FILM

David S. Winkler, Wooster, Ohio, and Jeffrey H. Diamond, Palm Beach, Fla., assignors to J. H. Diamond Company, Lake Worth, Fla.

Filed Jan. 13, 1984, Ser. No. 570,336

Int. Cl.³ C08G *18/10;* **C08L** *1/18, 75/04*

U.S. Cl. 524—31 **39 Claims**

1. A composition suitable for preparation of a strippable coating, said composition comprising:

an acrylate copolymer;

a mixing solvent comprising a solvent for said acrylate copolymer;

a prepolymer from a dimer diisocyanate and a difunctional monomer with an active hydrogen in each group; and,

a diamine;

said copolymer, said prepolymer and said diamine being mixed in the presence of said mixing solvent so as to provide said composition and said composition when dried as a coating on a substrate providing a coating which is not removable from said substrate by said mixing solvent but instead is removable as a cohesive film by a select solvent other than said mixing solvent.

4,526,914

WHITEWATER FORMULATION CONTAINING A CATIONIC POLYACRYLAMIDE

Rick L. Dolin, Littleton, Colo., assignor to Manville Service Corporation, Denver, Colo.

Filed Dec. 15, 1983, Ser. No. 561,624
Int. Cl.³ D21D *3/00;* D21H *3/46*
U.S. Cl. 524—42 **10 Claims**

1. A whitewater dispersant system for use in dispersing anionic fibers in an aqueous slurry in a wet-laid mat process comprising a cationic surfactant present in sufficient quantity to prevent said fibers from abrading each other in said aqueous slurry, said surfactant being cationic to improve adhesion to the surface of the anionic fibers, a viscosity modifier system in sufficient quantity to bring the viscosity of the whitewater dispersant system into the range from 2 to 12 centipoises and prevent said fibers from prematurely settling out of said aqueous slurry, said viscosity modifier system including a polyacrylamide, said polyacrylamide being cationic so as to avoid precipitating said cationic surfactant out of the slurry and so as not to cause flocculation of the fibers coated with said cationic surfactant.

4,526,915

WET ADHESION PROMOTERS FOR EMULSION POLYMERS

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 511,992, Jul. 8, 1983,. This application Oct. 1, 1984, Ser. No. 656,533
Int. Cl.³ C07D *233/36*
U.S. Cl. 524—83 **3 Claims**

1. An aqueous emulsion-copolymerized latex of copolymerized monoethylenically unsaturated monomers including from 0.1% to 10% of a copolymerizable monomer formed by reacting an aminoalkyl alkylene urea with about 0.9 up to about 1.3 molar proportions of a saturated monoepoxide to consume most or all of one of the two amino hydrogen atoms available on said alkylene urea, and then reacting with about 0.9 up to about 1.4 molar proportions of methacrylate-functional monoisocyanate in the presence of at least 0.02%, based on the total weight of the reactants present, of an inhibitor which retards the free-radical polymerization of ethylenic unsaturation, and phenothiazine.

4,526,916

CROSS-LINKABLE POLYETHYLENE COMPOSITIONS

George White, Glenburnie, Canada, assignor to Du Pont Canada Inc., Montreal, Canada

Filed Jan. 31, 1983, Ser. No. 462,380
Claims priority, application Canada, Feb. 9, 1982, 395824
Int. Cl.³ C08K *5/51*
U.S. Cl. 524—128 **14 Claims**

1. A composition consisting essentially of polyethylene having a density of 0.920–0.970 g/cm³ and a melt index in the range of 10–35 dg/min., 0.3–1.3%, by weight of the polyethylene, of a bis(tert. alkyl peroxyalkyl) benzene, 0.2–1.5%, by weight of the polyethylene, of a co-curing agent selected from the group consisting of triallyl cyanurate, triallyl isocyanurate and 1,2-polybutadiene, 0.01–0.05%, by weight of the polyethylene, of a hindered phenolic antioxidant and 0.01–0.2%, by weight of the polyethylene, of a secondary antioxidant selected from the group consisting of di(stearyl)-pentaerythritol diphosphite, tris di(tert.-butyl phenyl) phosphite, dilauryl thiodipropionate and bis(2,4-di-tert.-butylphenyl) pentaerythritol diphosphite.

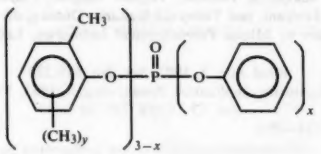
4,526,917

FLAME RETARDANT MIXTURE OF TRIARYL PHOSPHATES AND RESINOUS COMPOSITIONS THEREOF

Robert J. Axelrod, Glenmont, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 161,637, Jun. 20, 1980, abandoned. This application Feb. 23, 1984, Ser. No. 582,924
Int. Cl.³ C08L *71/04*
U.S. Cl. 524—141 **23 Claims**

1. A flame retardant composition comprising a mixture of aromatic phosphates represented by the following average formula



where x is zero or a whole or fractional number from slightly more than 0 to slightly less than 3 and y is a whole or fractional number from 1 to 2.

4,526,918

PHENOLIC PHOSPHITE ANTIOXIDANT AND PROCESS FOR PREPARATION THEREOF

Lester P. J. Burton, Pleasant Ridge, Mich.; assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 18, 1982, Ser. No. 350,085
Int. Cl.³ C08K *5/52;* C07F *9/146, 9/145*
U.S. Cl. 524—150 **24 Claims**

1. A process for making a phenolic phosphite adduct, said process comprising reacting at least about 0.05 mole parts of a phosphorus trihalide of formula PX_3 where the X are halides with one mole part 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxybenzyl) benzene to form a reaction product mixture including at least one adduct of the two reactants.

14. Organic material normally susceptible to gradual oxidative degradation, containing an antioxidant amount of an adduct formed by reacting at least about 0.05 mole parts of a phosphorus trihalide of formula PX_3 where the X are halides with one mole part 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxybenzyl)benzene.

4,526,919

POLYOLEFIN EXTRUSION COATING COMPOSITIONS HAVING GOOD COATABILITY AND GOOD ADHESION TO THE SUBSTRATE

Ray Edwards, Henderson, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1984, Ser. No. 625,332
Int. Cl.³ C08K *5/20;* C08L *23/06, 23/10, 93/04*
U.S. Cl. 524—232 **21 Claims**

1. An extrusion coating composition having a flow rate of 40 to 100 dg/min. at 230° C. which provides coatings of less than 1 mil which have heat seal strengths of at least 4.5 kg. per linear 2.5 cm. at coating speeds greater than 122 m./min. comprising a blend of (1) about 90 to 65 percent, by weight, of at least one crystalline polypropylene or propylene containing copolymer containing at least 80 weight percent propylene and having a melt flow rate of 30 to 140 dg/min. at 230° C., and (2) about 5

to 20 percent, by weight, of at least one polyethylene having a density of 0.916 to 0.925, a melt index at 190° C. of 2 to 7, and a swell ratio of about 1.5 to 2.2, (3) about 0.5 to 12.5 percent, by weight, of a hydrocarbon tackifying resin having a Ring and Ball softening point of about 75° C. to about 150° C., and (4) about 0.2 to 1.0 percent, by weight, fatty acid amide having 16 to 40 carbon atoms.

4,526,920

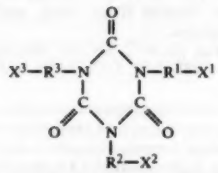
CURABLE COATING COMPOSITION CONTAINING ACRYLOYL OR METHACRYLOYL CYANURATE OR ISOCYANURATE COMPOUND, CURED COMPOSITION THEREFROM, AND PROCESS FOR PRODUCING ARTICLES BY USING THE CURABLE COMPOSITION

Takeshi Sakashita, Iwakuni; Hajime Inagaki, Ohtake; Akira Todo, Iwakuni, and Takayuki Nakano, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 2, 1983, Ser. No. 519,238
Claims priority, application Japan, Aug. 5, 1982, 57-135716
Int. Cl.³ C08F *226/06*
U.S. Cl. 524—850 **15 Claims**

1. In a curable coating composition comprising an acryloyl or methacryloyl isocyanurate compound, an acrylic or methacrylic ester compound and a polymerization initiator capable of curing said components; the improvement wherein said composition is composed of

(A) 100 parts by weight of at least one acryloyl- or methacryloyl-oxyalkyl isocyanurate compound of the following formula (I)



(I)

wherein each of X^1, X^2, and X^3 represents a member selected from the class consisting of a hydrogen atom, alkyl group having 1 to 4 carbon atoms, acryloyl group and methacryloyl group, provided that at least two of X^1, X^2 and X^3 are selected from the class consisting of acryloyl and methacryloyl groups, and each of R^1, R^2 and R^3 represents an oxyalkylene group $(-CH_2)_mO-$ or poly(oxyalkylene) group $(-CH_2)_mO-_n$ where m is from 1 to 12 and n is from 2 to 12,

(B) more than 0 and up to 1,000 parts by weight of at least one component selected from the group consisting of

(b_1) a polyacrylic ester or polymethacrylic ester of an oxy or polyoxy-alkanepolyol containing 1 to 3 ether linkages and 3 to 10 hydroxyl groups per molecule, the number average molecular weight of the ester being from about 240 to about 3,000, and

(b_2) a poly(meth)acrylic ester of an alkanepolyol having 4 hydroxyl groups per molecule,

(C) 0.01 to 20 parts by weight, per 100 parts by weight of the components (A) and (B) combined, of a polymerization initiator capable of curing said components, and

(D) 0 to 200 parts by weight, per 100 parts by weight of the components (A) and (B), of an inorganic solid filler.

15. A cured coating composition prepared by curing the curable coating composition of claim **1**.

4,526,921

ACETAL RESIN COMPOSITION

Masanori Sakurai; Junichi Miyawaki, both of Osaka; Toshikazu Umemura, Mie, and Akiyoshi Shibata, Hyogo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,489
Claims priority, application Japan, Mar. 3, 1983, 58-34803
Int. Cl.³ C08K *3/38*; C08L *59/02*
U.S. Cl. 524—405 **18 Claims**

1. An acetal resin composition comprising (a) an acetal resin and (b) a low molecular weight polycarbonate compound having an intrinsic viscosity of 0.2 dl/g or less in methylene chloride at 25° C., wherein said acetal resin is present in an amount of 80 to 99.9 parts by weight and said low molecular weight polycarbonate compound is present in an amount of 0.1 to 20 parts by weight per 100 parts by weight of the composition.

4,526,922

ORGANOFUNCTIONAL SILANE-SILOXANE OLIGOMER COUPLING COMPOSITIONS, CURABLE AND CURED ELASTOMERIC COMPOSITIONS CONTAINING SAME AND NOVEL ELECTRIC CABLE CONTAINING SAID CURED ELASTOMERIC COMPOSITIONS

Robert J. Pickwell, Mt. Kisco, and Frederick D. Osterholtz, Pleasantville, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 15, 1983, Ser. No. 485,301
Int. Cl.³ C08K *3/34*
U.S. Cl. 524—445 **10 Claims**

1. A curable composition comprising:

(1) an organic elastomer;

(2) an inorganic filler:

(3) a coupling composition comprising

(a) 5 to 95 wt. % of an ethylenically unsaturated silane having at least one silicon-bonded alkoxy group reactive with said inorganic filler and containing 1 to 4 carbon atoms and at least one silicon-bonded ethylenically unsaturated group polymerizable with said organic elastomer, any remaining valence of silicon being bonded to a monovalent hydrocarbon group having 1 to 6 carbon atoms free of ethylenic unsaturation;

(b) 95 to 5 wt. % of a saturated organosiloxane oligomer having per molecule no more than about 10 siloxy units and having per molecule at least one silicon-bonded alkoxy group reactive with said inorganic filler and containing 1 to 4 carbon atoms, any remaining silicon valence not bonded to alkoxy or another silicon through oxygen, being bonded to a monovalent hydrocarbon group free of ethylenic unsaturation and having 1 to 6 carbon atoms; and

(c) 0 to 10 wt. % of an ethylenically unsaturated organosiloxane oligomer having per molecule no more than 100 siloxy units and having per molecule at least one silicon-bonded ethylenically unsaturated group polymerizable with said organic elastomer, any remaining valence of silicon being bonded to a monovalent hydrocarbon group having 1 to 6 carbon atoms or an alkoxy group having 1 to 18 carbon atoms; and

(4) a peroxide capable of crosslinking said organic elastomer.

3. A curable composition as claimed in claim **1** wherein said organic elastomer is an ethylene-propylene copolymer, said filler is clay, and said coupling composition is characterized such that

(a) said ethylenically unsaturated silane is vinyltriethoxysilane, vinyltrimethoxysilane or gamma-methacryloxypropyltrimethoxysilane;

(b) said organosiloxane oligomer is a methyl ethoxy siloxane fluid having an average molecular weight of about 500, having an ethoxy content of 35 to 55 wt. %, and having the formula:

$C_2H_5O[(CH_3)(C_2H_5O)SiO]_xC_2H_5$

in which x is an integer of about 10; and

(c) said ethylenically unsaturated organosiloxane oligomer is methylvinyl siloxane fluid having the formula:

$C_{12}H_{25}O[(CH_3)(CH_2{=}CH)SiO]_yC_{12}H_{25}$

wherein y is an integer of 4 to 20.

4,526,923

POLYETHYLENE TEREPHTHALATE BLENDS

Edwin D. Hornbaker, and Jesse D. Jones, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 162,138, Jun. 23, 1980, abandoned. This application Apr. 18, 1984, Ser. No. 600,311

The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.³ C08L *51/00*

U.S. Cl. 524—502 **18 Claims**

1. A composition comprising a blend of (I) polyester selected from the group consisting of a polyethylene terephthalate and at least 90 mole percent polyethylene terephthalate, and (II) a copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride, the weight ratio of the polyester to the copolymer in the blend is from about 90:10 to about 10:90 respectively, said composition having a heat deflection temperature of at least about 84° C. at 264 psi as measured by the ASTM procedure D 648-72.

4,526,924

THERMOSETTABLE COMPOSITIONS CONVERTIBLE TO VITREOUS CARBON AND PROCESS FOR PREPARATION THEREOF

Louis L. Korb, and Phillip A. Waitkus, both of Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 394,104, Jul. 1, 1982, abandoned, which is a continuation of Ser. No. 280,846, Jul. 6, 1981, abandoned, which is a continuation of Ser. No. 50,535, Jun. 21, 1979, abandoned. This application Mar. 1, 1983, Ser. No. 470,978

Int. Cl.³ C08L *61/10*; **C08G** *3/04*

U.S. Cl. 524—541 **23 Claims**

1. A solid thermosettable intimate blend comprising 30–76 percent by weight of a finely divided carbonaceous particulate filler and 24–70 percent by weight of a finely divided phenolic resin mixture comprising 20–80 parts by weight of a phenolic-furfuraldehyde Novolak resin which is fusible upon heating, and 20–80 parts by weight of a phenolic-aldehyde resol resin, which is thermosettable upon heating, the sum of said parts of Novolak and resol resins totaling 100 parts by weight, the aldehyde in said Novolak comprising at least 50 molar percent of furfuraldehyde.

4,526,925

COPOLYMERS OF VINYL STYRLPYRIDINES OR VINYL STILBAZOLES WITH BISMALEIMIDE

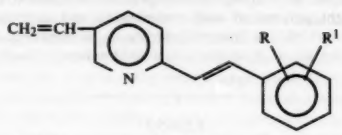
John A. Parker, Los Altos; Alvin H. Heimbuch, El Cerrito; Ming-Ta S. Hsu, and Timothy S. Chen, both of San Jose, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 18, 1983, Ser. No. 553,339

Int. Cl.³ C08F *222/40*, *226/06*

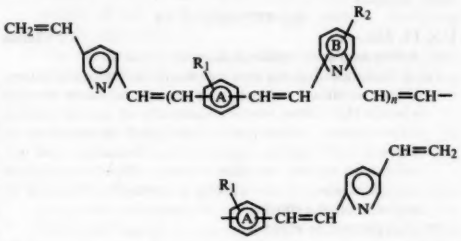
U.S. Cl. 524—548 **24 Claims**

1. A cured copolymeric resin comprising 15 to 1.0 parts by weight of bismaleimide copolymerized with one part by weight of a 5-vinyl-2-stilbazole of the structure



wherein R and R^1 are independently selected from the group consisting of hydrogen, lower alkyls, lower alkoxies, phenyl, alkyl phenyls of 7 to 9 carbons, chloro, bromo and iodo.

5. A cured copolymeric resin comprising 15 to 1.0 parts by weight of bismaleimide copolymerized with one part by weight of a vinyl styrylpyridine oligomer of the structure



wherein in the A aromatic rings R_1 is hydrogen or a lower alkyl and the two olefin bonds are attached to the aromatic ring meta or para to one another, and in the B aromatic ring R_2 is a lower alkyl, haloalkyl, or alkoxyl and the two olefin bonds are attached to the B aromatic ring in the 2, 6 or 2, 4 positions, with R_2 in the 4 or 6 position not occupied by an olefin bond.

16. A reinforced resin composite comprising 0.5 to 5 parts by weight of reinforcing fiber dispersed in one part by weight of the cured copolymeric resin of claim 1.

19. A reinforced resin composite comprising 0.5 to 5 parts by weight of reinforcing fiber dispersed in one part of the cured copolymeric resin of claim 5.

4,526,926

LOW GLOSS CARBONATE POLYMER BLENDS

Christian A. Weber, Sanford, and William P. Paige, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 22, 1983, Ser. No. 487,477

Int. Cl.³ C08L *51/04*, *55/02*, *69/00*

U.S. Cl. 525—67 **6 Claims**

1. A process for preparing a carbonate polymer composition having good physical properties and a gloss less than 70 percent as measured using a Gardner Instrument, Laboratory Model No. 260, wherein said carbonate polymer is a homopolycarbonate of bisphenol-A and is blended and extruded or injection molded with a rubber modified copolymer comprising from about 5 to about 50 weight percent rubber component, from about 49 to about 96 weight percent monovinylidene aromatic monomer, and from about 1 to about 48 weight percent monoethylenically unsaturated polar monomer wherein said rubber-modified copolymer is:

A. a composition prepared using mass, bulk or mass suspension polymerization techniques, or

B. a composition prepared by agglomerating or coagulating particles prepared by emulsion polymerization techniques, or

C. a combination of (A) and (B)

wherein said copolymer contains rubber particles having a particle size greater than about 0.5 microns in diameter, and wherein said rubber component is polyurethane rubber,

ethylene/vinyl acetate rubber silicon rubber, or diene rubbers, and wherein said copolymer comprises from about 40 to about 90 weight percent of said composition and said carbonate polymer which is a homopolycarbonate of bisphenol-A comprises from about 10 to about 60 weight percent of said composition.

4,526,927

THERMOPLASTIC MOLDING MATERIALS

Juergen Hambrecht, Heidelberg; Franz Brandstetter, Neustadt; Walter Ziegler, Edingen-Neckarhausen; Wolfgang F. Müller, Neustadt; Klaus Bronstert, Carlsberg, and Adolf Echte, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 509,761

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1982, 3226427

Int. Cl.[3] **C08L** *61/04*

U.S. Cl. 525—68 **2 Claims**

1. A thermoplastic molding material based on

(a) a non-modified styrene polymer, an impact-resistant, rubber modified styrene polymer or mixtures thereof wherein the rubber consists essentially of natural rubber, polybutadiene, polyisoprene, copolymers of butadiene or isoprene with styrene, copolymers of butadiene and isoprene with styrene, acrylate rubbers, ethylene-propylene non-conjugated diene rubbers, polybutylene rubbers or polyoctenamer rubbers,

(b) polyphenylene ethers and

(c) a component which improves the impact strength, wherein component (c) is a block copolymer obtained when a copolymer of ethylene with an acrylate, methacrylate, anhydride, epoxide-containing monomer or carbon monoxide is reacted with an active polymeric anion comprising one or more anionically polymerized monomers, said block copolymer having the formula (A_n):$(B_1)_k(C_m)_j$ where A is CH_2—CH_2—, B is an acrylate, methacrylate, an anhydride, epoxide-containing monomer, or carbon monoxide, C_m is obtained from one or more monomers, n and m are each integers greater than 30, 1, i, k and j are each integers greater than or equal to 1, and k.1 ≅ j.

4,526,928

α-METHYLSTYRENE HIGH-CONTENT COPOLYMERS, A PROCESS FOR THEIR PRODUCTION AND THERMOPLASTIC RESIN COMPOSITIONS CONTAINING α-METHYLSTYRENE HIGH-CONTENT COPOLYMERS BLENDED WITH GRAFT COPOLYMERS

Shigemi Mathumoto, Takasago, and Fumiya Nagoshi, Kobe, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki, Osaka, Japan

Division of Ser. No. 271,205, Jun. 8, 1981,. This application Jan. 14, 1983, Ser. No. 458,133

Claims priority, application Japan, Jun. 16, 1980, 55-81860

Int. Cl.[3] **C08F** *212/10;* **C08L** *25/12*

U.S. Cl. 525—76 **1 Claim**

1. A thermoplastic resin composition comprising:

(A) a high α-methylstyrene content copolymer comprising 65–90 parts by weight of α-methylstyrene, 35–10 parts by weight of acrylonitrile and 0–5 parts by weight of a copolymerizable vinyl monomer other than the α-methylstyrene and acrylonitrile, based on 100 parts by weight of the copolymer, the copolymer being prepared by the steps comprising:

charging a system with 65 parts by weight or more of α-methylstyrene monomer and 10% by weight or less, based on the α-methylstyrene monomer, of acrylonitrile monomer and a vinyl monomer or vinyl monomers other than the α-methylstyrene monomer and the α-acrylonitrile monomer,

emulsifying the system, and

emulsion polymerizing the emulsified monomers while continuously and gradually adding at least 10 and up to 35 parts by weight of acrylonitrile monomer and 5 parts by weight or less of vinyl monomer or vinyl monomers other than the α-methylstyrene monomer and the acrylonitrile monomer to form a copolymer comprising α-methylstyrene and acrylonitrile; wherein the ratio of the α-methylstyrene monomer to acrylonitrile monomer is maintained in the system at 90:10 or higher on a weight basis, until the amount of the resulting copolymer produced is 50 parts by weight or more, based on 100 parts by weight of the resulting copolymer, and

(B) a graft copolymer which is obtained by reacting 35-85% by weight of a diene rubber selected from the group consisting of polybutadiene, polyisoprene and butadiene-styrene copolymers with 65–15% by weight of a component comprising a monovinyl compound selected from the group consisting of α-methylstyrene, chlorostyrene and tertiary-butyl styrene and an unsaturated nitrile compound selected from the group consisting of acrylonitrile and methacrylonitrile, the ratio of the monovinyl compound to the unsaturated nitrile compound being 85–60:-15–40 on a weight basis,

wherein (A) and (B) are mixed in amounts so that the diene rubber content of the composition after mixing is 5–30% by weight.

4,526,929

RESIN COMPOSITION USABLE WITHOUT BEING COATED

Kazuo Kishida, Ohtake; Akira Hasegawa, Hiroshima; Yasunori Kawachi, Ohtake; Hiroshi Kawasaki, and Hiroshi Mizukoshi, both of Yokohama, all of Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed Jul. 20, 1981, Ser. No. 284,668

Claims priority, application Japan, Aug. 13, 1980, 55-111181

Int. Cl.[3] **C08L** *31/02, 33/08, 33/10, 51/08*

U.S. Cl. 525—80 **15 Claims**

1. A resin composition which is usable for an exterior article without being coated on its surface when molded into the article and is excellent in the color tone and has good impact resistance and weatherability, said composition comprising (I) 10 to 70% by weight of a high-rubber-content graft polymer obtained by polymerizing 50 to 10% by weight of a monomer mixture (C) comprising 10 to 90% by weight of at least one aromatic vinyl monomer and 90 to 10% by weight of at least one ethylenically unsaturated monomer represented by the following general formula:

$$CH_2{=}CRX$$

wherein R stands for a hydrogen atom or methyl group, and X stands for a group —CN or —$COOR_1$ in which R_1 stands for an alkyl group having 1 to 8 carbon atoms, in the presence of a latex of multi-layer crosslinked acrylic rubber particles containing 5 to 30% by weight of a rigid crosslinked resin (A) having a core particle size of 0.30 to 0.40μ in the interior of the rubber particles and 45 to 85% by weight of a crosslinked acrylic acid ester polymer (B) comprising an acrylic acid ester as the main component in the outer layer of the rubber particles, so that the total amount of the components (A), (B) and (C) is 100% by weight, (II) 90 to 30% by weight of a thermoplastic resin obtained by polymerizing at least one alkyl acrylate or methacrylate represented by the following general formula:

$$CH_2{=}CRCOOR_1$$

wherein R stands for a hydrogen atom or methyl group, and R_1 stands for an alkyl group having 1 to 8 carbon atoms, in an amount of at least 90% by weight, and (III) 0 to 50% by weight of a diene type rubber-containing thermoplastic resin, the sum of the amounts of the components (I), (II) and (III) being 100% by weight.

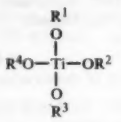
4,526,930
PRODUCTION OF WATER-CURABLE, SILANE MODIFIED THERMOPLASTIC POLYMERS

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 23, 1983, Ser. No. 534,354
Int. Cl.³ C08L *51/06, 43/04*
U.S. Cl. 525—105 **38 Claims**

1. A composition of matter comprising a preformed thermoplastic polymer havin pendant silane moieties of the formula:

wherein R is a straight chain hydrocarbon radical having a minimum of 4 carbon atoms or a branched chain hydrocarbon radical having a minimum of 3 carbon atoms, each V is a hydrocarbon radical having 1 to 18 carbon atoms inclusive or an —OR radical wherein R is as previously defined; and an organo titanate of the formula:



wherein R^1 is methyl, ethyl or propyl and R^2, R^3 and R^4 are hydrogen or hydrocarbon radicals having 1 to 18 carbon atoms inclusive; wherein said organo titanate is present in an amount sufficient to ester exchange at least one ester group of the titanate for one ester group of the silane.

4,526,931
WHITENING-RESISTANT, HIGHLY MELT-VISCOELASTIC ETHYLENE-PROPYLENE COPOLYMER AND PROCESS FOR PRODUCING THE SAME

Hiromasa Chiba; Takakiyo Harada; Katsumi Kumahara; Shunji Kawazoe, and Akihiro Sato, all of Ichiharashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Oct. 9, 1984, Ser. No. 658,868
Claims priority, application Japan, Oct. 31, 1983, 58-204438
Int. Cl.³ C08F *297/08*
U.S. Cl. 525—268 **11 Claims**

1. A whitening-resistant, highly melt viscoelastic ethylene-propylene copolymer, obtained by copolymerizing propylene with ethylene,

in the presence of a catalyst prepared by reacting an organoaluminum compound (I) or a reaction product (VI) of an organoaluminum compound (I) with an electron donor (A), with titanium tetrachloride (C), further reacting the resulting solid product (II) with an electron donor (A) and an electron acceptor (B), and combining the resulting solid product (III) with an organoaluminum compound (IV) and an aromatic caboxylic acid ester (V), the molar ratio (V/III) of the aromatic carboxylic acid ester to the solid product (III) being in the range of 0.1 to 10.0,

at the following four stages:

(1) the first stage wherein propylene or a mixed gas of ethylene with propylene, containing 0 to 7.5% by weight of ethylene, is fed to a reactor to form a polymer; successively

(2) the second stage wherein propylene or a mixed gas of ethylene with propylene, containing 0 to 15% by weight of ethylene is fed to the reactor to form a polymer;

(3) the amount of ethylene fed at the first stage and the second stage being in the range of 0.7 to 7.5% by weight based on the total amount of the mixed gas; (4) 60 to 89% by weight of the total polymerization amount (excluding soluble copolymer) being polymerized at the first stage and the second stage, and the proportion of the polymerization amount at the first stage to that at the second stage being in the range of 0.65:0.35 to 0.35:0.65;

(5) between the intrinsic viscosities of the polymers formed at the first stage and the second stage, the intrinsic viscosity of the polymer having a higher molecular weight $[\eta]_H$ and that of the polymer having a lower molecular weight $[\eta]_L$ having a relationship satisfying the following equation:

$$3.0 \leqq [\eta]_H - [\eta]_L \leqq 6.5 \quad (1);$$

successively,

(6) the third stage wherein ethylene or a mixed gas of ethylene with propylene, containing 70 to 100% by weight of ethylene, is fed to the reactor to polymerize 5 to 17% by weight of the total polymerization amount (excluding soluble copolymer);

(7) the intrinsic viscosity of a polymer formed at the third stage $[\eta]_3$ having a relationship satisfying the following equation:

$$[\eta]_L \leqq [\eta]_3 \leqq [\eta]_H \quad (2);$$

successively

(8) the fourth stage wherein a mixed gas of ethylene with propylene containing 40 to 70% by weight of ethylene is fed to the reactor to copolymerize 6 to 23% by weight of the total polymerization amount (excluding soluble copolymer); and

(9) the intrinsic viscosity of the copolymer formed at the fourth stage $[\eta]_4$ satisfying the following equation:

$$[\eta]_L \leqq [\eta]_4 \leqq [\eta]_H \quad (3).$$

4,526,932
ANTIFOULING AGENT

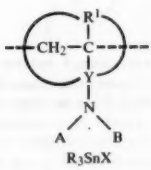
Hideyuki Imazaki, Osaka, and Kazuhiko Sakamoto, Suita, both of Japan, assignors to Nitto Kasei Co., Ltd., Osaka, Japan

Filed Apr. 6, 1983, Ser. No. 482,558
Claims priority, application Japan, Apr. 6, 1982, 57-57862; Apr. 13, 1982, 57-62204
Int. Cl.³ C08F *8/42*
U.S. Cl. 525—326.7 **10 Claims**

1. An antifouling agent comprising as an antifouling copolymer containing

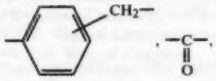
(a) 10 to 80% by weight of at least one kind of N-coordinated-triorganotin-containing recurring units of the formula

(Ia)

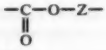


wherein R^1 represents a hydrogen atom, a methyl group or a halogen atom; (i) when A and B independently from each other represent a hydrogen atom, an alkyl group having 1 to 18 carbon atoms, a cycloalkyl group, an aryl group, an aralkyl group, a hydroxyalkyl group having 2 to 4 carbon atoms or a group of the formula

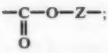
in which R^3 represents an alkyl group having 1 to 18 carbon atoms, or an aryl group, Y represents a bond, an alkylene group having 1 to 12 carbon atoms, a phenylene group, a group of the formula



or a group of the formula

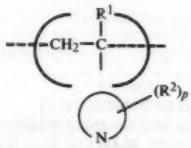


or —O—Z— in which Z represents an alkylene group having 2 to 12 carbon atoms, or (ii) when A and B are bonded to each other together with the nitrogen atom to which they are bonded, to form a 5- or 6-membered heterocyclic ring, Y represents a bond or a group of the formula



groups R are identical or different and each represents an alkyl group having 1 to 8 carbon atoms or an aryl group; and X represents a halogen atom, or

(Ib)

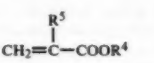


R_3SnX

wherein R^1, R and X are as defined as in regard to formula (Ia); R^2 represents a hydrogen atom, a methyl group, an ethyl group or a halogen atom; p is an integer of from 1 to 4; the symbol

represents a 5- or 6-membered heterocyclic ring bonded through a ring-member atom other than the nitrogen atom to the carbon atom to which R^1 is bonded, and

(b) 90 to 20% by weight of comonomer recurring units derived from at least one ethylenic vinyl compound as a comonomer selected from the group consisting of acrylic compounds of the formula



wherein R^4 represents a hydrogen atom, a substituted or unsubstituted hydrocarbon group having 1 to 20 carbon atoms, and R^5 represents a hydrogen or a methyl group; vinyl compounds having a functional group of the formula

wherein Q represents a halogen atom, —CN, —OR^* or —$OCOR^*$ in which R^* represents a substituted or unsubstituted hydrocarbon group having 1 to 20 carbon atoms, and Q' represents a hydrogen atom, a halogen atom or a methyl group;

and styrene, said percent by weight being based on the total weight of these two kinds of recurring units.

4,526,933

POLYMERIC ACTIVE METHYLENE COMPOUNDS, THEIR PREPARATION AND THEIR USE IN AZO POLYMERS

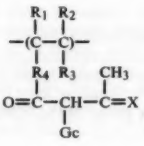
Patricia C. Wang, Palo Alto, and Daniel J. Dawson, Los Altos, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Division of Ser. No. 319,624, Nov. 9, 1981, abandoned. This application Feb. 17, 1984, Ser. No. 581,445

Int. Cl.³ C08F *8/30*

U.S. Cl. 525—326.8 **16 Claims**

1. A polymer comprising a repeat unit of the structure



wherein X is O or N— and each of R_1, R_2, and R_3 is independently selected from among hydrogen and 1 to 4 carbon lower alkyls, R_4 is selected from among

aromatic amines and aromatic hydrazines which additionally provide X as N— and Gc is an organic group.

4,526,934

BRANCHED STYRENE-BUTADIENE COPOLYMERS AND PNEUMATIC TIRES USING THE SAME

Noboru Oshima, Suzuka; Isamu Shimizu, Kameyama; Yoshito Yoshimura, Yokkaichi; Tatsuo Fujimaki, Higashimurayama, and Seisuke Tomita, Tokorozawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,394

Claims priority, application Japan, Mar. 19, 1982, 57-42955; Mar. 25, 1982, 57-47946

Int. Cl.³ C08F *8/42*

U.S. Cl. 525—332.9 **4 Claims**

1. A branched styrene-butadiene copolymer obtained by coupling an active styrene-butadiene copolymer anion, prepared by the process comprising (a) polymerizing styrene and butadiene in the presence of ether or a tertiary amine and an initiator of an organolithium compound in a hydrocarbon solvent, (b) adding 1 to 20 mole of 1,3 butadiene per 1 gram atom of lithium in the initiator to the resulting polymer of step (a), and (c) coupling the resulting styrene butadiene copolymer of step (b) with a tin halide compound, wherein :

(I) a content of branched copolymer connected with tin-butadienyl bond in said copolymer is at least 20% by weight;

(II) a content of bound styrene in said copolymer is not less than 3% by weight but less than 25% by weight; and

(III) a content of vinyl bond in the butadiene portion of said copolymer is not less than 30% but less than 50%.

4,526,935

WATER SOLUBLE POLYAMINES AND PROCESS FOR THEIR PREPARATION

William K. Wilkinson, Waynesboro, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 6, 1983, Ser. No. 492,488

Int. Cl.³ C08F *8/32*

U.S. Cl. 525—345 **4 Claims**

1. Process for preparing a water soluble polyamine by reaction of an acrylonitrile polymer containing at least 50% by weight acrylonitrile units with a dialkylaminoalkylamine wherein the reaction takes place in a solvent for the acrylonitrile polymer, at least 0.5 mols dialkylaminoalkylamine is used per nitrile group in the polymer, the reaction is catalyzed by at least 2 and no more than 20 mol percent based on S of ammonium polysulfide or a sulfur-containing catalyst convertible to ammonium polysulfide under the conditions of the reaction per mol acrylonitrile unit in the acrylonitrile polymer, and the reaction is carried out in the presence of air at 70°–120° C. for 3 to 120 minutes.

4,526,936

PROCESS FOR THE PREPARATION OF POLYMERIC AMINE CONTAINING PRODUCTS

Felek Jachimowicz, and Per E. A. Hansson, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Mar. 18, 1983, Ser. No. 476,773

Int. Cl.³ C08F *8/32*

U.S. Cl. 525—379 **15 Claims**

1. A process of forming polymeric products having a hydrocarbon backbone and secondary or tertiary or mixed alkyleneamine pendant groups comprising contacting in a reaction zone, a mixture of an inert substantially anhydrous, organic liquid media, a polymeric hydrocarbon having olefinic groups present in its hydrocarbon backbone, a primary or secondary amine, carbon monoxide and hydrogen heating said mixture at a temperature of from about 100° C. to about 250° C. at a pressure of from about 30 to 300 atmospheres in the presence of a catalytic amount of at least one Group VIII metal containing compound for a sufficient period of time to cause the formation of the polymeric polyamine product, and recovering said polymeric polyamine product.

4,526,937

POLYCARBONATES HAVING PLASTICIZERS WITH FUGITIVE ACTIVITY

Chin C. Hsu, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 528,313, Aug. 31, 1983, abandoned. This application Jun. 20, 1984, Ser. No. 622,620

Int. Cl.³ C08F *2/08, 22/02, 20/06, 120/06*

U.S. Cl. 524—724 **18 Claims**

1. A process comprising polymerizing olefinically unsaturated carboxylic acids containing at least one activated carbon-to-carbon olefinic double bond and at least one carboxyl group in the presence of 50 to 99 weight percent of a solvent selected from organic liquids and mixtures thereof in which said carboxylic acids are at least partially soluble and in which the resulting polymers are substantially insoluble, a free radical forming catalyst, and greater than 0.5 to less than 10 weight parts per 100 weight parts of carboxyl containing polymers formed of hydroxyl terminated polyoxyethylene-polypropylene-polyoxyethylene block copolymers of propylene oxide and ethylene oxide having HLB above 10 and molecular weights in the range of about 2500 to about 20,000 and containing from about 10 to about 80 weight percent of polyoxyethylene units, to form a polymer containing about 40 to 100 weight percent of said unsaturated carboxylic acid.

2. A process of claim 1 wherein in said carboxylic acid the olefinic double bond is in the alpha-beta position with respect to a carboxyl group or is part of a terminal methylene group.

3. A process of claim 2 wherein said carboxylic acid is selected from the group consisting of acrylic acid, methacrylic acid, and maleic acid.

4. A process of claim 3 wherein said carboxylic acid is acrylic acid present in amounts of greater than 40 weight percent and from 0 to 60 weight percent of at least one other olefinically unsaturated monomer containing at least one $CH_2{=}C<$ group is copolymerized therewith.

5. A process of claim 4 wherein said acrylic acid is present in amounts greater than 70 weight percent and there is present less than 5 weight percent of a polyfunctional cross-linking olefinically unsaturated monomer containing at least two terminal $CH_2<$ groups.

4,526,938

CONTINUOUS RELEASE FORMULATIONS

Jeffrey R. Churchill, Northwich, and Francis G. Hutchinson, Lymm, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

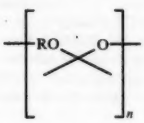
Filed Apr. 15, 1983, Ser. No. 485,454

Claims priority, application United Kingdom, Apr. 22, 1982, 8211704

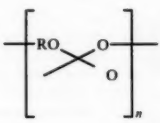
Int. Cl.³ C08L *5/02, 51/00, 71/02, 79/00*

U.S. Cl. 525—415 **4 Claims**

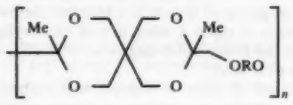
1. A pharmaceutically or veterinarily acceptable amphipathic, non-cross-linked linear, branched or graft block copolymer, which has a minimum weight average molecular weight of 5,000, in which the hydrophobic component is biodegradable or hydrolytically unstable under normal physiological conditions, and the hydrophilic component may or may not be biodegradable, the coplymer being capable of absorbing water to form a hydrogel when placed in water or an aqueous physiological-type environment in an animal body, the amphipathic copolymer being a linear block copolymer of the formula $A_m(BA)_n$ or $B_m(AB)_n$ wherein m is 0 or 1, n is an integer, A is a pharmaceutically or veterinarily acceptable hydrophobic polymer and B is a pharmaceutically or veterinarily acceptable hydrophilic polymer, or the amphipathic copolymer is a graft or branched block copolymer of the formula AB_n or BA_n wherein A, B and n have the meanings stated above and wherein respectively either A or B is a backbone polymer with n units of a monomer or polymer B or A respectively grafted onto it, and wherein A is selected from poly (D-, L- and DL-lactic acids), poly (D-, L- and DL-lactides), polyglycolic acid, polyglycolide, poly- caprolactone, poly(3-hydroxy-butyric acid), non-therapeutic hydrophobic polypeptides, polyacetals of the formula:



wherein R is a hydrocarbon radical, and n has the meaning stated above, polycarbonates or polyorthoesters of the formula:



wherein R and n have the meanings stated above, and copolymers of the formula:



wherein R and n have the meanings stated above, and copolymers derived from two or more monomers from which the above polymers are derived; and the pharmaceutically or veterinarily acceptable hydrophilic polymer B is selected from polyvinyl alcohol, polyvinylpyrrolidone, polyethylene glycol, polyacrylamide, polymethacrylamide, dextran, alginic acid, sodium alginate, and gelatine, and copolymers of two or more of the monomers from which the above polymers are derived, and polyoxyethylene/polyoxypropylene block copolymers.

4,526,939

THERMOSETTING COATING COMPOSITIONS FOR THE SEALING OF FIBER REINFORCED PLASTICS

Ronald J. Lewarchik, Arlington Heights; Kevin P. Murray, Homewood; Marcella G. Donovan, Ingleside, and Arthur T. Jones, Chicago, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 18, 1983, Ser. No. 515,029
Int. Cl.³ C08L *67/02*
U.S. Cl. 525—438 **17 Claims**

1. A thermosetting organic solvent solution coating composition containing a mixture of resins comprising (1) from 30% to 70% of one or more hydroxy functional resins having a number average molecular weight of at least about 700, a Gardner bubble viscosity less than about Z_4 measured in methyl ethyl ketone at 90% solids at 25° C., and at least 5% of the hydroxy groups thereof being primary hydroxy groups, (2) from 10% to 70% of low molecular weight epoxy ester made by esterifying one or more resinous polyepoxides having a 1,2-epoxy equivalency of at least 1.2 with an approximately stoichiometric proportion of monocarboxylic fatty acid to provide an essentially epoxy-free ester having a Gardner bubble viscosity less than Z_4 at 75% solids in xylol at 25° C., and (3) the balance of the mixture, but not less than 15% thereof, being a curing agent having a plurality of groups reactive with the hydroxy groups in the hydroxy resin and in the epoxy ester, said composition having a total solids content of at least 35%.

4,526,940

HYDROXYL TERMINATED POLYFUNCTIONAL EPOXY CURING AGENTS

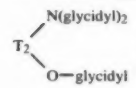
John P. Seymour, Fishkill, N.Y., and John A. Gannon, Danbury, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 464,087, Feb. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 386,142, Jun. 7, 1982, abandoned. This application Jul. 5, 1984, Ser. No. 628,118
Int. Cl.³ C08G *59/14*; C08L *63/02*
U.S. Cl. 525—526 **20 Claims**

1. A polyfunctional phenolic hydroxyl terminated hardener product, useful in the curing of epoxy resins, which is the reaction product of

(a) a polyglycidyl compound of the formula I, II, III or IV,

$$T_1[-N(\text{glycidyl})_2]_2, \quad \text{(I)}$$



(II)

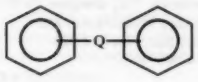
-continued

$$T_3(-O-\text{glycidyl})_{3\ or\ 4} \text{ or} \quad \text{(III)}$$

$$T_4(\text{glycidyl})_3 \quad \text{(IV)}$$

wherein

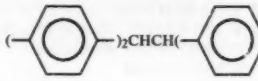
T_1 is 1,2-phenylene, 1,3-phenylene, 1,4-phenylene or



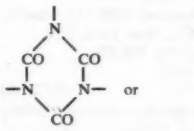
where Q is alkylene of 1 to 6 carbon atoms, alkylidene of 2 to 6 carbon atoms, —SO_2—, —SO—, —S—, —S—S—, —O— or —CO—,

T_2 is 1,2-phenylene, 1,3-phenylene or 1,4-phenylene,

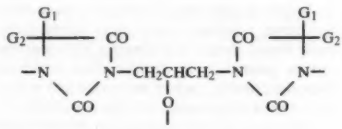
T_3 is 1,2,3-benzenetriyl, 1,2,4-benzenetriyl, 1,3,5-benzenetriyl or



T_4 is



or



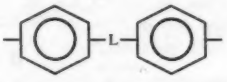
where G_1 and G_2 are independently alkyl of 1 to 6 carbon atoms or are together alkylene of 4 to 5 carbon atoms, and

(b) a diglycidyl compound of the formula

glycidyl—O—E—O—glycidyl

where

E is 1,2-phenylene, 1,3-phenylene, 1,4-phenylene or



where L is a direct bond, alkylene of 1 to 6 carbon atoms or alkylidene of 2 to 6 carbon atoms, wherein the ratio of equivalents of polyglycidyl compound (a) to diglycidyl compound (b) is from 1 to 4 to 1 to 1, with

(c) a bisphenol of the formula

HO—E_1—OH

where E_1 has the same definitions as E, but is independent of E, wherein the ratio of equivalents of bisphenol component (c) to the total equivalents of glycidyl compounds (a) plus (b) is from 1.8 to 1 to 2.4 to 1, and where each glycidyl group is effectively endcapped with a moiety contain-

ing a free phenolic hydroxyl group by reaction of components (a) and (b) with (c) in the presence of an effective amount of a catalyst for promoting said reaction at a temperature between 120° and 300° C.

4,526,941

POLYMERIZATION OF OLEFINS

Hisaya Sakurai; Tadashi Ikegami; Masayoshi Miya, and Katsuhiko Takaya, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 316,366, Oct. 29, 1981, abandoned. This application Sep. 23, 1983, Ser. No. 535,459

Claims priority, application Japan, Nov. 11, 1980, 55-157629; Nov. 11, 1980, 55-157630; Nov. 14, 1980, 55-159577; Nov. 19, 1980, 55-161853

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—127 **33 Claims**

1. A process for polymerizing an α-olefin which comprises contacting the α-olefin at a temperature of about 10° C. to about 100° C. with a catalyst comprising a slurry component (A) and an organometallic component (B), the component (A) being obtained, without intermediate or final solids separation, by reacting (1) a slurry reaction mixture produced by reacting one mol of (i) a hydrocarbon-soluble organomagnesium component of the general formula

$$M_\alpha Mg_\beta R_p^1 R_q^2 X_r Y_s$$

wherein

α, p, q, r and s each independently is 0 or a number greater than 0,

β is a number greater than 1,

$p+q+r+s=m\alpha+2\beta$,

m is the valence of M,

M is a metal of the 1st to 3rd groups of the Periodic Table,

R^1 and R^2 each independently is a hydrocarbon group having 1 to 20 carbon atoms,

X and Y each independently is a hydrogen atom, a halogen atom, OR^3, $OSiR^4R^5R^6$, NR^7R^8 or SR^9 wherein R^3, R^4, R^5, R^6, R^7 and R^8 each independently is a hydrogen atom or a hydrocarbon group having 1 to 20 carbon atoms and R^9 is a hydrocarbon group having 1 to 20 carbon atoms,

or of the reaction product of $M_\alpha Mg_\beta R_p^1 R_q^2 X_r Y_s$ with at least one electron donor selected from the group consisting of ethers, thioethers, ketones, aldehydes, carboxylic acids or derivatives thereof, alcohols, thioalcohols and amines, with 0.1 to 10 mols of (ii) a chlorosilane compound of the formula

$$H_a SiCl_b R_{4-(a+b)}^{10}$$

wherein

R^{10} is a hydrocarbon group having 1 to 20 carbon atoms,

$0<a\leqq 2$ and

b is a number greater than 1 at a temperature of about 20° C. to about 150° C.,

with (2) a titanium compound of the formula

$$Ti(OR^{11})_n Z_{4-n}$$

wherein

R^{11} is a hydrocarbon group having 1 to 20 carbon atoms,

Z is a halogen atom and

$0\leqq n\leqq 4$,

and (3) a nitrogen- or sulfur-containing heterocyclic carboxylic acid ester or a hydrocarbyl carboxylic acid ester and the mol ratio of (2) the titanium compound/(3) the carboxylic acid ester being at least 0.3.

4,526,942

CATALYST FOR OLEFIN POLYMERIZATION

Arthur W. Chester, Cherry Hill, and James G. Murray, East Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 305,233, Sep. 24, 1981, Pat. No. 4,377,497. This application Jan. 10, 1983, Ser. No. 456,927

Int. Cl.³ C08F *4/06*

U.S. Cl. 526—130 **14 Claims**

1. A process for polymerizing 1-olefins, which process comprises contacting 1-olefin monomer with a catalytically effective amount of a catalyst composition comprising the reaction product of a pi-bonded organochromium [II] compound and a crystalline aluminosilicate zeolite having a silica to alumina molar ratio of at least about 12 and a Constraint Index in the approximate range of about 1 to 12, under polymerization conditions which include a temperature and pressure suitable for initiating and promoting the polymerization reaction.

4,526,943

PROCESS FOR POLYMERIZING OLEFINS IN THE PRESENCE OF A CATALYST PREPARED FROM ORGANOMAGNESIUM COMPOUND, ORGANIC HYDROXYL-CONTAINING COMPOUND, REDUCING HALIDE SOURCE AND TRANSITION METAL COMPOUND

Ricardo Fuentes, Jr., and Calvin P. Esneault, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 403,206, Jul. 29, 1982, abandoned. This application Jan. 26, 1984, Ser. No. 574,754

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—133 **8 Claims**

1. In a process for the polymerization of one or more polymerizable ethylenically unsaturated monomers containing one or more polymerizable α-olefins under Ziegler polymerization conditions wherein the polymerization is conducted in the presence of (I) at least one cocatalyst or activator selected from aluminum, boron, zinc or magnesium compounds represented by the formulas $Al(R^3)_{3-a}X'_a$, $B(R^3)_{3-a}X'_a$, MgR^3_2, MgR^3X', ZnR^3_2 or mixtures thereof wherein each R^3 is independently a hydrocarbyl group; X' is a halogen and a has a value of from zero to 2; and (II) a transition metal-containing catalyst; the improvement which comprises employing as the transition metal-containing catalyst an unseparated catalytic product resulting from

admixing in an inert hydrocarbon diluent and in an atmosphere which excludes moisture and oxygen

(A) at least one hydrocarbon soluble organo-magnesium material represented by the formula $R_2Mg.xMeR'_{x'}$, wherein each R is independently a hydrocarbonyl group having from 1 to about 20 carbon atoms, each R' is independently hydrogen or a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms, Me is Al, Zn or B, x has a value sufficient to render the magnesium compound hydrocarbon soluble and x' has a value equal to the valence of Me;

(B) at least one organic hydroxyl-containing material;

(C) at least one reducing halide source represented by the formula $Al(R^4)_{3-m}X_m$ or $B(R^3)_{3-m}X_m$ wherein each R^3 is independently hydrogen or a hydrocarbyl group, R^4 is ethyl and m has a value from 1 to 2; and

(D) at least one transition metal (Tm) compound; and wherein

(1) the components are added in the order (A), (B), (C) and (D) or (A), (B), (D) and (C); and

(2) the components are employed in quantities so as to provide the following atomic ratios

(a) Mg:Tm of from about 5:1 to about 100:1;

(b) Cl:Mg of from about 6:1 to about 20:1; and

(c) the OH:total number of hydrocarbyl groups attached to a metal atom in component (A) is from about 0.5:1 to about 1.5:1.

4,526,944
PREPARATION OF α-MONOOLEFIN HOMOPOLYMERS AND COPOLYMERS

Gerhard Staiger, Bobenheim-Roxheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1981, Ser. No. 240,103

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011236

The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

Int. Cl.³ C08F *4/64, 10/00*

U.S. Cl. 526—142 **2 Claims**

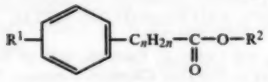
1. A process for the preparation of homopolymers and copolymers of C_2–C_6-α-monoolefins at from 20° to 160° C., under a pressure of from 1 to 100 bar, by means of a Ziegler-Natta catalyst system comprising

(1) a titanium halide of the formula

ti $TiCl_3.mAlCl_3$

where m is from 0 to 0.5,

(2) an oxygen compound of the formula



where

R^1 is hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,

R^2 is C_1–C_4-alkyl, and

n is an integer from 0 to 3,

and

(3) an aluminum-alkyl of the formula

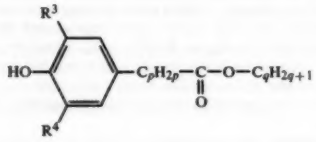
where

X and Y are each alkyl of not more than 8 carbon atoms and

Z is chlorine or alkyl of not more than 8 carbon atoms,

with the proviso that (I) the molar ratio of titanium halide (1):oxygen compound (2) is from 1:1 to 20:1, (II) the molar ratio of titanium halide (1):aluminum-alkyl (3) is from 1:1 to 1:20, and (III) the titanium halide (1) and the oxygen compound (2) have been milled together before use, in which process the catalyst system employed contains, as a further component

(4) a phenolic compound of the formula



where

R^3 is C_1–C_6-alkyl,

R^4 is hydrogen or C_1–C_6 -alkyl,

p is an integer from 0 to 5, and

q is an integer from 1 to 5,

with the proviso that the molar ratio of aluminum-alkyl (3):phenolic compound (4) is from 1:1 to 40:1.

4,526,945
LOW MOLECULAR WEIGHT POLYMERS AND COPOLYMERS

Gary M. Carlson, North Olmsted, and Kirk J. Abbey, Cleveland, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Mar. 21, 1984, Ser. No. 591,804

Int. Cl.³ C08F *4/06, 220/10, 120/18*

U.S. Cl. 526—145 **5 Claims**

1. A process for producing a low molecular weight methacrylic polymer comprising:

copolymerizing ethylenically unsaturated monomers comprising a methacrylic monomer alone or a methacrylic monomer and other ethylenic monomer in the presence of an effective amount of free radical catalyst in combination with between 0.0001% and 0.01% Cobalt (II) glyoxime catalyst comprising a Cobalt (II) glyoxime modified by a basic ligand selected from the group consisting of pyridine, triphenylphosphine or imidazole derivatives based on the weight of said ethylenically unsaturated monomer to produce a low molecular weight methacrylate polymer having a number average molecular weight between about 500 and 20,000.

4,526,946
POLYVINYL CHLORIDE SUSPENSION POLYMERIZATION PROCESS AND PRODUCT HAVING IMPROVED PLASTICIZER ABSORPTION

Stephen T. Fitzpatrick, Gilbertsville, and Richard M. Krawiec, Audubon, both of Pa., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,321

Int. Cl.³ C08F *2/08, 2/20*

U.S. Cl. 526—202 **11 Claims**

1. A process for the suspension polymerization of vinyl halide which comprises the following steps:

(1) preparing a solution of a non-aqueous resin seed material, a polymerization initiator and other oil-soluble additives in the vinyl halide, wherein said resin seed material is prepared from monomer in a volatile organic medium that is a solvent for the monomer and a non-solvent for the resin;

(2) preparing a solution of suspending agent and other water-soluble additives in water;

(3) introducing solutions (1) and (2) into a polymerization reaction zone;

(4) initiating agitation to a sufficient level to form oil-phase droplets of the size of the desired product particle size, said droplets having a uniform concentration of initiator in the vinyl halide, and continuing the agitation and maintaining elevated reaction temperature until the reaction proceeds to 70 to 95 percent conversion; and

(5) recovering the resin product;

wherein the levels of suspending agent and agitation are chosen to substantially preclude agglomeration of resin particles during the reaction; thereby producing resin wherein the resin grain size distribution results directly from the oil phase droplet distribution created in step (4).

4,526,947
N,N-DIMETHYLACRYLAMIDE COPOLYMER INJECTION WATER VISCOSIFIER FOR ENHANCED OIL RECOVERY

Kenneth F. Castner, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 14, 1982, Ser. No. 378,154

Int. Cl.³ C08F *230/04, 220/56*

U.S. Cl. 526—240 **55 Claims**

1. A high molecular weight water soluble polymer consisting essentially of chain linkages derived from a major amount of N,N-dimethylacrylamide and at least one member selected from the group consisting of N-methylolacrylamide and sodium styrene sulfonate having a molecular weight above about

1,000,000 wherein said water soluble polymer has from 0.1 to 5 weight percent of its chain linkages being derived from at least one member selected from the group consisting of N-methylolacrylamide and sodium styrene sulfonate.

4,526,948

FLUORINATED VINYL ETHERS, COPOLYMERS THEREOF, AND PRECURSORS THERETO

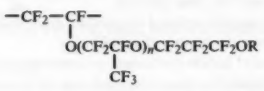
Paul R. Resnick, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Dec. 27, 1983, Ser. No. 565,778

Int. Cl.³ C08F *214/18, 214/26*

U.S. Cl. 526—247 **3 Claims**

1. A copolymer comprising about 70 to 95 mol % —CX_2—CX_2— units wherein the four X's are four fluorines or three fluorines and one chlorine, and about 5 to 30 mol % of substituted ethylene units of the formula



wherein n is 0 or 1 and R is CH_3 or C_2H_5, said substituted ethylene units being randomly positioned throughout the copolymer chain.

4,526,949

ACRYLATE AND METHACRYLATE MONOESTERS OF PENTAERYTHRITOL AND PENTAERYTHRITOL ORTHOESTERS AND POLYMERS AND COPOLYMERS DERIVED THEREFROM

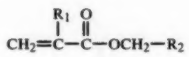
Henry K. Hall, Tucson, Ariz., and Donald R. Wilson, Warren, N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 248,183, Mar. 30, 1981, Pat. No. 4,405,798. This application Jun. 16, 1982, Ser. No. 389,015

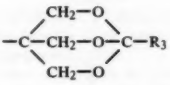
Int. Cl.³ C08F *24/00*

U.S. Cl. 526—268 **5 Claims**

1. A vinyl-acrylic copolymer useful for the preparation of a textile which is characterized by the formation of a crosslinking latex, said vinyl-acrylic copolymer comprising a composition incorporating an alpha, beta-ethylenically unsaturated monoester of the general formula



in which R_1 is hydrogen or a methyl group and R_2 is the group



wherein R_3 is hydrogen or a lower alkyl group.

4,526,950

METHOD FOR PREPARING INTERPOLYMERS

Arturs Grava, Mayfield Hts., Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 370,030, Apr. 20, 1982, abandoned. This application Oct. 28, 1983, Ser. No. 546,639

Int. Cl.³ C08F *24/00*

U.S. Cl. 526—272 **11 Claims**

1. In a method for preparing an interpolymer of reagent (A) at least one aliphatic alpha-olefin having a least six (6) carbon atoms and reagent (B) at least one unsaturated carboxylic acid or derivative thereof copolymerizable with reagent A, which method comprises polymerizing reagent A and reagent B in the presence of reagent (C) a free radical initiator:

the improvement which comprises effecting said polymerization by heating a mixture comprising reagents A, B and C, the first two used in reactive amounts only such that neither reagent is present in excess so as to serve as a diluent for the reaction, at a temperature of at least about 135° C., mixture being characterized by the absence of a solvent or diluent.

4,526,951

POLYMERIC COMPOSITIONS OF CO- AND TERPOLYMERS

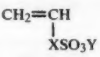
Robert D. Lundberg, Bridgewater, and Robert A. Weiss, Summit, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 251,042, Apr. 6, 1981, abandoned, which is a continuation of Ser. No. 117,198, Jan. 31, 1980, abandoned. This application May 9, 1983, Ser. No. 492,945

Int. Cl.³ C08F *228/02*

U.S. Cl. 526—240 **6 Claims**

1. A solid, elastomeric, substantially gel free (stable) co- or terpolymer comprising at least 80% by weight of or a mixture of styrene and said conjugated diene and a minor proportion of a metal or amine neutralized sulfonate monomer characterized by the formula:



where X is aromatic and Y is a cation selected from Groups IA, IIA, IB and IIB of the Periodic Table or an amine of the formula:

where R_1 and R_2 can be aliphatic groups of C_1 to C_{12} or hydrogen said co- or terpolymer being water insoluble, substantially gel-free, thermally stable and having at least 0.7 weight percent sulfur with a reduced viscosity as measured in a solvent at a concentration of 10 gm/liter of greater than 0.2 to less than 5.0 said co -or terpolymer not being able to form a latex in an aqueous solution.

4,526,952

ANTISTATIC OR ELECTRICALLY CONDUCTIVE THERMOPLASTIC POLYURETHANES: PROCESS FOR THEIR PREPARATION AND THEIR USE

Gerhard Zeitler, Hessheim; Gerhard Bittner; Knud Faehndrich, both of Diepholz, and Hans M. Rombrecht, Quernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,430

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321516

Int. Cl.³ C08K *3/04*

U.S. Cl. 524—496 **8 Claims**

1. A process for the manufacture of antistatic or electrically conductive thermoplastic polyurethanes comprising incorporating carbon black into a thermoplastic polyurethane in an amount of from 2 weight percent to 35 weight percent, based on the weight at the finished polurethane, at a temperature below the thermoplastic polyurethane rigid crystalline segment melting point peak, wherein said carbon black is characterized by

(1) a surface area of from 600 m^2/g to 1200 m^2/g;

(2) a dibutyl phthalate absorption number of from 300 to 450 cm^3 per 100 g of carbon black;
(3) a pour density of less than 250 kg/m^3; and
(4) an average particle size of less than 50 nm.

4,526,953
MODIFIED SILICONE RELEASE COATING COMPOSITIONS

Anthony J. Dallavia, Jr., Macon, Ga., assignor to General Electric Company, Waterford, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,093
Int. Cl.³ C08G 77/06
U.S. Cl. 528—15 **11 Claims**

1. A solventless silicone release coating composition comprising:
(A) an addition curable alkenyl functional diorganopolysiloxane base polymer having up to about 20 percent by weight alkenyl functional groups and having a viscosity of from about 50 to 100,000 cps at 25° C.;
(B) a SiH-containing polysiloxane crosslinking agent having up to about 100 percent by weight SiH-containing siloxy groups and having a viscosity in the range of about 15 to 1000 cps at 25° C.;
(C) an effective amount of precious metal or precious metal complex catalyst to promote an addition cure hydrosilation reaction between said base polymer and said crosslinking agent; and
(D) an amount of α-olefin, or a mixture of olefins, having up to about 30 carbon atoms, effective to enhance said addition cure.

4,526,954
ORGANOSILOXANE POLYMERS AND COMPOSITIONS CONTAINING SAME CURABLE UPON EXPOSURE TO GASEOUS OXYGEN

Thomas C. Williams, Ridgefield, Conn., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 28, 1983, Ser. No. 566,297
Int. Cl.³ C08G 77/06
U.S. Cl. 528—15 **30 Claims**

1. A polyorganosiloxane that is curable to a crosslinked material at ambient temperature upon exposure to gaseous oxygen, said polyorganosiloxane containing, per molecule, at least one monovalent olefinically polyunsaturated organic radical containing at least one 1,3-pentadienylene group or 1,4-pentadienylene group bonded to silicon through silicon-to-carbon bond and wherein any remaining valence of silicon is satisfied by a silicon-to-oxygen-to-silicon bond or by a monovalent organic radical free of more than one olefinically unsaturated group per said monovalent organic radical, said monovalent organic radical being bonded to silicon by a silicon-to-carbon bond.

4,526,955
RADIATION POLYMERIZABLE COMPOSITIONS CONTAINING ORGANOPOLYSILOXANES HAVING A —N—SI— OR —N—O—SI— LINKAGE

Lester D. Bennington, Adrian, and Richard C. McAfee, Tecumseh, both of Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Filed Jan. 3, 1984, Ser. No. 567,711
Int. Cl.³ C08G 77/26, 77/04
U.S. Cl. 528—33 **15 Claims**

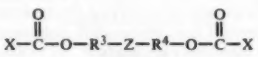
1. A composition capable of being cured to an elastomer by irradiation comprising an organopolysiloxane having an average of at least one nitrogen containing group per molecule linked to a silicon atom through an Si—N or Si—O—N linkage and a photo-induced free radical generating compound in an amount of from about 0.01 to 20 percent by weight based on the weight of the siloxane, said nitrogen containing organopolysiloxane is obtained from the reaction of an organopolysiloxane having at least two hydroxyl groups per molecule with an organosilicon compound having an average of more than one nitrogen containing reactive group per molecule selected from the group consisting of an amine, aminoxy, amide, oxime and mixtures thereof.

4,526,956
COPOLYESTER-CARBONATES EXHIBITING IMPROVED PROCESSABILITY

Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 9, 1982, Ser. No. 448,386
Int. Cl.³ C08G 63/64
U.S. Cl. 528—176 **21 Claims**

1. Thermoplastic copolyester-carbonate compositions exhibiting improved processability comprised of at least one copolyester-carbonate resin consisting essentially of the reaction products of:
(i) at least one dihydric phenol;
(ii) at least one difunctional carboxylic acid or an ester forming reactive derivative thereof;
(iii) a carbonyl halide carbonate precursor; and
(iv) a processability improving amount of at least one bishaloformate selected from bishaloformates represented by the general formula



wherein:
X is independently selected from chlorine and bromine;
R^3 and R^4 are independently selected from divalent aliphatic hydrocarbon radicals; and
Z is selected from the following divalent radicals
(a) the —O— radical,
(b) the —S— radical,
(c) the

radical,
(d) the

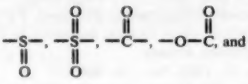
radical,
(e) the

radical,
(f) the

radical,
(g) the —O—C—O— radical,
(h) the $—(R^6)_d—Ar—(R^7)_e—$ radical wherein Ar represents a divalent aromatic radical, R^6 and R^7 are independently selected from alkylene radicals, and the

letters d and e are independently selected from zero or one, and

(i) a divalent organic aliphatic hetero non-cyclic radical containing at least one carbon atom and at least one hetero group or atom selected from —O—, —S—,



4,526,957

COPOLYMERS OF MALEIC ANHYDRIDE AND ALKYLENE OXIDE TO INHIBIT THE PRECIPITATION AND DEPOSIT OF SCALE IN AQUEOUS SYSTEMS

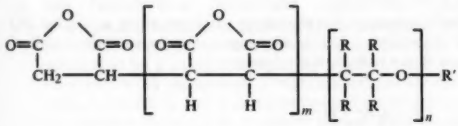
Gary F. Matz, Pitcairn, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Feb. 24, 1983, Ser. No. 469,324

Int. Cl.³ C08G *67/04*

U.S. Cl. 528—366 **10 Claims**

1. A copolymer of maleic anhydride and an alkylene oxide of the formula:



wherein

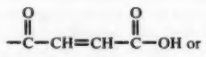
m is at least 4,

n is at least 1,

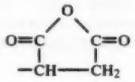
the ratio of m to n is at least 4:1,

R, which is the same or different, is a hydrogen, halogen, alkyl or phenyl, and

R′ is:



(a)



(b)

4,526,958

PARTICLE FORM EVAPORATION START-UP

William R. King, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 427,221, Sep. 29, 1982, abandoned. This application Aug. 12, 1983, Ser. No. 522,773

Int. Cl.³ C08F *6/00*; C08C *4/00*

U.S. Cl. 528—502 **3 Claims**

1. A method for startup of a particle form evaporation process, said method comprising:

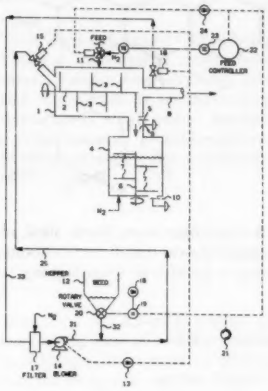
(a) introducing a first portion of seed into a first vessel at a rate independent of temperature to form an initial seed bed within said first vessel,

(b) mechanically agitating said initial seed bed,

(c) sensing the temperature of the agitated seed bed, and

(d) controlling the rate at which additional seed is introduced into the agitated seed bed in response to the temperature of the agitated seed bed;

wherein the seed comprises solid particles and is comprised of the same type of polymer that is to be introduced into the particle form evaporator is part of the feed; and wherein the temperature of the seed bed is maintained at a temperature of at least the boiling point of the solvent or liquid



to be evaporated but below that point at which significant thermal degradation of the polymer will occur.

4,526,959

PROCESS FOR EXTRACTING RUBBER AND BY-PRODUCTS FROM GUAYULE AND GUAYULE-LIKE SHRUBS

Edward L. Kay, Akron, and Richard Gutierrez, Canal Fulton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 298,447, Sep. 1, 1981, Pat. No. 4,435,337, which is a continuation-in-part of Ser. No. 263,387, May 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 149,862, May 14, 1980, abandoned. This application Feb. 25, 1983, Ser. No. 469,872

Int. Cl.³ C08C *4/00*

U.S. Cl. 528—930 **12 Claims**

1. In the process for recovering usable products from guayule and guayule-like fibrous shrubs comprising the steps of:

(a) grinding the guayule shrub;

(b) extracting resins from the ground shrub; and

(c) extracting rubber from the ground shrub with hydrocarbon solvent,

in which steps (b) and (c) are performed either sequentially or in reverse order; the improvement which comprises:

(d) extracting the resins from the ground shrub with an organic solvent selected from the group consisting of acetone and concentrated resin miscella containing acetone and at least 4% resin

(e) extracting the rubber by percolation of the hydrocarbon solvent through a bed of the ground shrub.

4,526,960

ANTHRACYCLINE GLYCOSIDES

Michael J. Broadhurst, Baldock; Cedric H. Hassall, Harpenden, and Gareth J. Thomas, Luton, all of United Kingdom, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

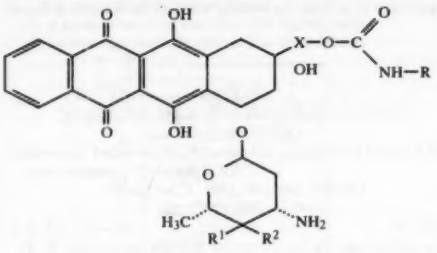
Filed Sep. 26, 1983, Ser. No. 535,968

Claims priority, application United Kingdom, Sep. 28, 1982, 8227686; Jul. 15, 1983, 8319251

Int. Cl.³ C07H *15/24*

U.S. Cl. 536—6.4 **13 Claims**

1. A compound of the formula

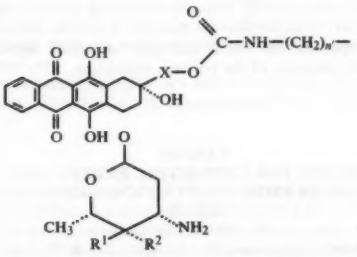


I

wherein R a hydrogen atom, lower alkyl, phenyl, substituted phenyl, phenyl-(lower alkyl) or substituted phenyl-(lower alkyl) group, a pyridyl or thienyl group or a group of the formula

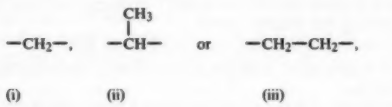
(a)

or



(b)

wherein R' is a hydroxy, lower alkoxy, amino, lower alkylamino, di(lower alkyl)-amino or phenyl amino or substituted phenyl amine group, n**140** stands for an integer or 1 to 4, n' stands for an integer of 2 to 10, R^1 and R^2 each are a hydrogen atom or one of R^1 and R^2 is a hydrogen atom and the other is a hydroxy, lower alkoxy or benzyloxy group and X is a group of the formula



(i) (ii) (iii)

and pharmaceutically acceptable acid addition salts thereof.

4,526,961

PROCESS FOR ETHERIFYING CELLULOSE WITH ALKYL MONOCHLOROACETATES

Eberhard Perplies, Walluf, and Utz H. Felcht, Bad Soden-Neuenhain, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,692

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 3236158

Int. Cl.³ C08B *11/193, 11/08*

U.S. Cl. 536—98 **20 Claims**

1. A process for preparing water-soluble sodium carboxymethyl cellulose, comprising the steps of:

alkalyzing cellulose in an aqueous-alkaline dispersion to produce an alkali cellulose; and

subsequently etherifying said alkali cellulose, with a neutral etherifying mixture comprising alkyl monochloroacetate, in the presence of an organic solvent to produce a sodium carboxymethyl cellulose.

4,526,962

CEPHALOSPORIN DERIVATIVES

Daniel Farge; Pierre Le Roy, both of Thiais; Claude Moutonnier, Le Plessis Robinson; Jean-Francois Peyronel, Palaiseau, and Bernard Plau, Creteil, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

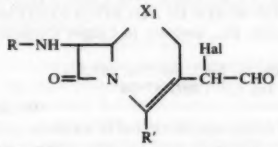
Filed Aug. 16, 1982, Ser. No. 408,712

Claims priority, application France, Aug. 17, 1981, 81 15805

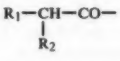
Int. Cl.³ C07D *501/20;* **A61K** *31/545*

U.S. Cl. 544—016 **15 Claims**

1. A cephalosporin of the formula:



in which R' represents a protected carboxyl radical in which the protecting radical is chosen from t-butyl, methoxymethyl, 2,2,2-trichloroethyl, benzhydryl, p-nitrobenzyl and p-methoxybenzyl, Hal represents a halogen atom; and either (A) X_1 represents a sulphur or oxygen atom or a sulphinyl radical and R is a radical of the formula:



in which R_1 is a heterocyclic radical chosen from thienyl, furyl and 1,3-dithiol-2-on-4-yl, or a phenyl or phenoxy radical or a free or protected p-hydroxyphenyl radical in which the hydroxy-protecting radical is chosen from trityl, tetrahydropyranyl, alkoxycarbonyl, benzyloxycarbonyl and p-methoxybenzyl and R_2 is a hydrogen atom, or R_1 is a phenyl or free or protected p-hydroxyphenyl radical in which the hydroxy-protecting radical is chosen from trityl, tetrahydropyranyl, alkoxycarbonyl, benzyloxycarbonyl and p-methoxybenzyl and R_2 is a protected amino radical chosen from t-butoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, trityl, benzyl, benzyloxycarbonyl, formyl, trifluoroacetyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl and diphenylphosphinoyl and a group of the formula:

in which Z is an alkyl or 2,2,2-trichloroethyl group or a phenyl or benzyl group each of which is unsubstituted or substituted by a halogen atom or by an alkyl, alkoxy or nitro radical, or the symbols Z together form an alkylene radical containing 2 or 3 carbon atoms, or R is an amino-protecting radical which can easily be removed chosen from

(1) benzhydryl or trityl,

(2) an acyl radical of the formula:

in which R_3 represents

(a) a hydrogen atom, alkyl of 1 to 7 carbon atoms, or methyl substituted by 1 to 3 halogen atoms,

(b) phenyl, which is unsubstituted or substituted by up to three halogen atoms or hydroxyl, nitro, cyano, trifluoromethyl, alkyl or alkoxy radical, or thien-2-yl or thien-3-yl.

(c) a radical of the formula:

$R'_3—Y—CH_2—$

in which R'_3 is a phenyl radical which is unsubstituted or substituted by halogen or by alkyl, alkoxy or hydroxyl and Y is an oxygen or sulphur atom, or

(d) a radical of the formula:

$R''_3CH_2—$

in which R''_3 is a phenyl radical which is unsubstituted or substituted by up to three hydroxyl, alkyl or alkoxy radicals, or a heterocyclic radical selected from thien-2-yl, thien-3-yl, furan-2-yl and furan-3-yl,

(3) a 5-aminoadipoyl radical, the amino group of which is protected by a radical chosen from t-butoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, trityl, benzyl, benzyloxycarbonyl, formyl, trifluoroacetyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl and diphenylphosphinoyl and a group of the formula:

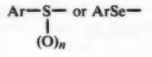
in which Z is an alkyl or 2,2,2-trichloroethyl group or a phenyl or benzyl group each of which is unsubstituted or substituted by a halogen atom or by an alkyl, alkoxy or nitro radical, or the symbols Z together form an alkylene radical containing 2 or 3 carbon atoms and the acid group of which is protected by a radical chosen from t-butyl methoxymethyl, 2,2,2-trichloroethyl, benzhydryl, p-nitrobenzyl and p-methoxybenzyl,

(4) a radical of the formula:

$R_4OCO—$

in which R_4 is an unsubstituted branched alkyl radical, a linear or branched alkyl radical carrying one or more substituents chosen from halogen atoms or cyano, trialkylsilyl or phenyl radicals or phenyl radicals substituted by one or more halogen atoms or by alkyl, alkoxy nitro or phenyl radicals, or R_4 is a quinolyl radical, and

(5) a radical of the formula:



in which the radical Ar is a phenyl radical which is unsubstituted or substituted by one or more halogen atoms or alkyl or nitro radicals and n is 0 or 1,

(6) or alternatively RNH— is replaced by a dialkylaminomethyleneamino radical or by a radical of the formula:

$Ar'—CH=N—$

in which Ar' is a phenyl radical which is unsubstituted or substituted by one or more alkyl, alkoxy, hydroxyl or nitro radicals,

(7) or R is a diphenylphosphinoyl radical or a radical of the formula:

in which Z is alkyl, 2,2,2-trichloroethyl, phenyl or benzyl, these last two being unsubstituted or substituted by a halogen atom or by alkyl, alkoxy or nitro, or the symbols Z together form an alkylene radical of 2 or 3 carbon atoms; or (B) X_1 represents a sulphur atom and R represents a radical of the formula:

$R''—CO—$

in which R'' is an alkyl radical of 1 to 7 carbon atoms, or a cycloalkyl radical, or a radical chosen from benzyl, p-hydroxybenzyl, 4-amino-4-carboxybutyl (the amino group of which is protected by t-butoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, trityl, benzyl, benzyloxycarbonyl, formyl, trifluoroacetyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenylphosphinoyl, or by a group of the formula:

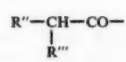
in which Z is an alkyl or 2,2,2-trichloroethyl group or a phenyl or benzyl group each of which is unsubstituted or substituted by a halogen atom or by an alkyl, alkoxy or nitro radical, or the symbols Z together form an alkylene radical containing 2 or 3 carbon atoms, and the acid group of which is protected by t-butyl, methoxymethyl 2,2,2-trichloroethyl, benzhydryl, p-nitrobenzyl or p-methoxybenzyl), 3-nitrobenzyl, 4-nitrobenzyl, phenethyl, 2-methoxyphenyl, 2-6-dimethoxyphenyl, protected p-aminobenzyl or protected o-aminobenzyl (in which the amino protecting group is chosen from t-butoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, trityl, benzyl, benzyloxycarbonyl, formyl, trifluoroacetyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl or diphenylphosphinoyl and a group of the formula:

in which Z is an alkyl or 2,2,2-trichloroethyl group or a phenyl or benzyl group each of which is unsubstituted or substituted by a halogen atom or by an alkyl, alkoxy or nitro radical, or the symbols Z together form an alkylene radical containing 2 or 3 carbon atoms), p-methoxybenzyl, naphth-1-yl-methyl, isothiazol-3-yl-methyl, isothiazol-4-yl-methyl, isothiazol-5-yl-methyl, pyridin-4-yl-methyl, isoxazol-5-yl-methyl, benzofuranylmethyl, indol-2-yl-methyl, 3-methylimidazol-1-methyl, 5-methylthien-2-yl-methyl, 5-methylthien-3-yl-methyl, 5-methoxythien-2-yl-methyl, 5-methoxythien-3-yl-methyl, 4-chlorothien-2-yl-methyl, 4-chlorothien-3-yl-methyl, 1,2,5-thiadiazol-3-yl-methyl, 4-methoxy-1,2,5-thiadiazol-3-yl- methyl and tetrazolylmethyl;

or R is a radical of the formula:

$R''—Y—(CH_2)_m—CO—$

in which m is an integer from 0 to 4, Y is an oxygen or sulphur atom and R'' is as defined above, or R is a radical of the formula:



in which R'' is as defined above and R''' is a halogen atom or a hydroxy, protected hydroxy, azido, acyloxy, protected amino or protected carboxyl radical in which the hydroxy-protecting radical is chosen from trityl, tetrahydropyranyl, alkoxycarbonyl, benzyloxycarbonyl, and p-methoxybenzyl, the amino protecting radical is chosen

from t-butoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, trityl, benzyl, benzyloxycarbonyl, formyl, trifluoroacetyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl or diphenylphosphinoyl and a group of the formula:

in which Z is an alkyl or 2,2,2-trichloroethyl group or a phenyl or benzyl group each of which is unsubstituted or substituted by a halogen atom or by an alkyl, alkoxy or nitro radical, or the symbols Z together form an alkylene radical containing 2 or 3 carbon atoms, and the carboxyl-protecting radical is chosen from t-butyl, methoxymethyl, 2,2,2-trichloroethyl, benzhydryl, p-nitrobenzyl and p-methoxybenzyl, or R—NH— represents a sulphonamido group, it being understood that the abovementioned alkyl and acyl portions and radicals are linear or branched and are of 1 to 4 carbon atoms each, and the isomeric forms of the said cephalosporin and mixtures thereof.

4,526,963

DIOXAZINE PIGMENTS

Michel Deur, Mulhouse, France, assignor to Sandoz Ltd., Basel, Switzerland

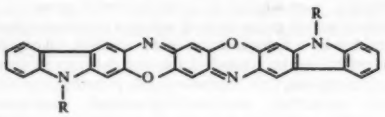
Filed Oct. 28, 1982, Ser. No. 437,369

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1981, 3143403

Int. Cl.³ C07D *498/22*

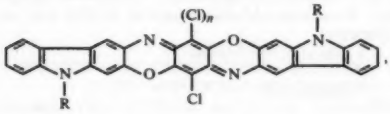
U.S. Cl. 544—74 **17 Claims**

1. A mixture of dioxazine compounds consisting essentially of a compound or mixture of compounds of formula I



(I)

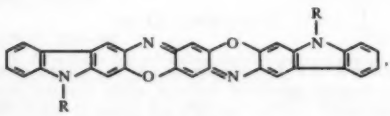
in which each R, independently, is C_{1-4}alkyl, in an amount at least 20%, by weight, and a monochloro and a dichloro-dioxazine of formula III



(III)

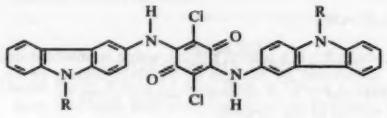
wherein each R is as defined above and n is 0 or 1.

7. A process for producing a dioxazine compound of formula I



(I)

in which each R, independently, is C_{1-4}alkyl, which comprises cyclizing a compound of formula II



(II)

in which each R is as defined above, in the presence of an organic acid.

4,526,964

2,4-DIAMINO-6-(HYDROXYMETHYL)PYRIDO[2,3-D]PYRIMIDINE

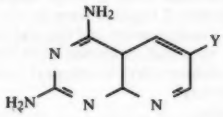
Carroll G. Temple; John A. Montgomery, and Robert D. Elliott, all of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Continuation-in-part of Ser. No. 338,542, Jan. 11, 1982, Pat. No. 4,431,805, which is a continuation-in-part of Ser. No. 305,907, Sep. 25, 1981, abandoned. This application Aug. 31, 1982, Ser. No. 413,501

Int. Cl.³ C07D *471/04;* A61K *31/505*

U.S. Cl. 544—279 **2 Claims**

1. Intermediates useful in the production of 5-deaza analogs of folic acid, N^{10}-substituted folic acid, aminopterin, and N^{10}-substituted aminopterin consisting of compounds having the structure:



wherein Y is CH_2OH or CH_2Br.

4,526,965

URACIL DERIVATIVES OF THIO- AND SELENOUREA COMPOUNDS

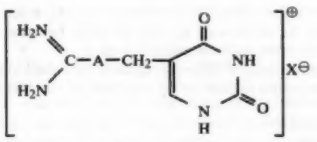
James R. Bartels-Keith, Lexington, and Anthony J. Puttick, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 16, 1983, Ser. No. 533,265

Int. Cl.³ C07D *239/54;* G03C *1/10*

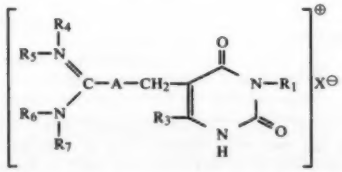
U.S. Cl. 544—311 **6 Claims**

1. A compound represented by the formula



where A is sulfur or selenium and X is an anion.

3. A compound as defined in claim 1 which is represented by the formula



wherein R_1 is hydrogen or alkyl having from 1 to 6 carbon atoms; R_3 is hydrogen or alkyl having from 1 to 6 carbon atoms; and R_4, R_5, R_6 and R_7 are the same or different and are hydrogen, alkyl, phenyl, acetyl, benzoyl, amino or amino substituted with alkyl having from 1 to 6 carbon atoms.

4,526,966
POLYALKYLDIAZASPIRODECANE DERIVATIVES

Hartmut Wiezer, Lützelburg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 4, 1983, Ser. No. 491,609

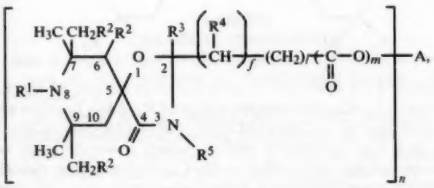
Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218172

Int. Cl.[3] **C07D** *498/10, 498/20, 211/48*

U.S. Cl. 546—19 **3 Claims**

1. A polyalkyldiazaspirodecane derivative of the formula (I)

(I)



in which R^1 is hydrogen, oxygen, C_1 to C_{12} alkyl which can be substituted by OH, or 2,3-dihydroxypropyl, R^2 represents hydrogen or C_1 to C_5 alkyl, R^3 represents C_1 to C_5 alkyl which can be substituted by —COOH, —$COOCH_3$ or —$COOC_2H_5$, or represents phenyl and R^4 is then hydrogen, or R^3 and R^4, together with the carbon atoms linking them, form a C_5 to C_{12} cycloalkane ring, f is 0 or 1, l denotes an integer from 0 to 10, m is 1, n denotes 1, R^5 represents hydrogen, or C_1 to C_{12} alkyl which can be substituted by OH in the 2-position, or represents a group of the formula —$(CH_2)_kCOOR^6$ in which k is 1 or 2 and R^6 is a C_1 to C_{18} alkyl group, A represents hydrogen, C_1 to C_{18} alkyl, C_3 to C_7 alkenyl, C_7 to C_9 phenylalkyl, C_5 to C_{12} cycloalkyl or 2,2,6,6-tetramethyl-4-piperidinyl.

4,526,967
BENZOQUINOLIZINES AND USE AS α_2-ADRENOCEPTOR ANTAGONISTICS

Terence J. Ward, Slough, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Filed Mar. 19, 1984, Ser. No. 590,653

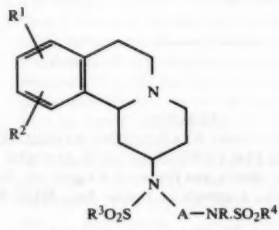
Claims priority, application United Kingdom, Mar. 25, 1983, 8308321; Dec. 13, 1983, 8333232

Int. Cl.[3] **A01N** *43/40;* **A61K** *31/435;* **C07D** *455/06, 221/06*

U.S. Cl. 546—95 **10 Claims**

1. A compound selected from the group consisting of a benzoquinolizine of the formula

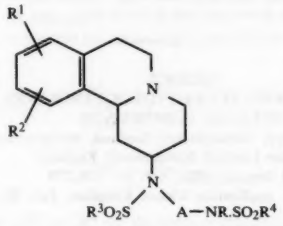
(I)



and a pharmaceutically acceptable acid addition salt thereof, wherein R represents hydrogen or lower alkyl, R^1 and R^2 which may be the same or different each represent hydrogen, lower alkyl, lower alkoxy or halogen, R^3 and R^4 which may be the same or different each represents lower alkyl, halo(lower-)alkyl or aryl and A represents a lower alkylene group having 1 to 3 carbon atoms in the chain between the two N atoms.

8. A method of antagonising α_2-adrenoceptors in warm blooded animals which comprises administering to the animal an effective amount of a compound selected from the group consisting of a benzoquinolizine of the formula

(I)



and a pharmaceutically acceptable acid addition salt thereof, wherein R represents hydrogen or lower alkyl, R^1 and R^2 which may be the same or different each represent hydrogen, lower alkyl, lower alkoxy or halogen, R^3 and R^4 which may be the same or different each represents lower alkyl, halo(lower-)alkyl or aryl and A represents a lower alkylene group having 1 to 3 carbon atoms in the chain between the two N atoms.

4,526,968
QUATERNARY AMINEHYDROXYPROPANE SULFOBETAINES

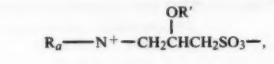
Kenneth W. Lemke, Englishtown, and Maynard W. McNeil, Washington, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Division of Ser. No. 295,349, Aug. 24, 1981, Pat. No. 4,430,171. This application Jul. 16, 1982, Ser. No. 399,101

Int. Cl.[3] **C07D** *213/02, 215/10, 217/00;* **C25D** *3/18*

U.S. Cl. 546—139 **4 Claims**

1. A quaternary amine-hydroxypropane sulfobetaine of the formula



wherein

N^+ is a heterocyclic tertiary amine group selected from a pyridine, quinoline or isoquinoline group,

R is a halogen or lower alkyl group,

R′ is an R″C(O)— group,

R″ is a lower alkyl group and

a is 0–5.

4,526,969
TRIFLUOROMETHYL SUBSTITUTED PERFLUORO QUINOLIZINES

Kazumasa Yokoyama, Toyonaka; Chikara Fukaya, Osaka; Yoshio Tsuda, Takarazuka; Taizo Ono, Osaka; Yoshio Arakawa, Suita, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Dec. 28, 1982, Ser. No. 454,108

Claims priority application, Japan, Nov. 27, 1981, 56-191358

Int. Cl.[3] **C07D** *455/02*

U.S. Cl. 546—164 **8 Claims**

1. A perfluorobicyclo compound of the general formula:

wherein either or both of Ring A and Ring B may optionally be substituted with perfluoroalkyl group(s) having from 1 to 3 carbom atoms, and the total number of carbon atoms in the compound of the above formula is 10 to 12.

4,526,970

PREPARATION OF TETRAHYDROQUINOLINES AND RELATED COMPOUNDS

Robin G. Shepherd, Maidenhead, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

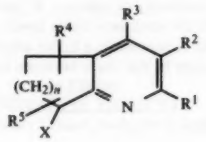
Filed Jun. 21, 1983, Ser. No. 506,279

Claims priority, application United Kingdom, Jun. 25, 1982, 8218465

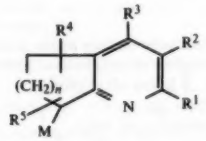
Int. Cl.³ C07D *215/16, 219/04, 221/06, 221/16*

U.S. Cl. 546—169 **12 Claims**

1. A process for preparing compounds of formula I



or acid addition salts thereof, wherein R^1, R^2, R^3, R^4 and R^5 are the same or different and represent hydrogen or alkyl of 1–6 carbon atoms, cycloalkyl of 4–8 carbon atoms, phenylalkyl of 7–12 carbon atoms or phenyl groups, any of which groups may be substituted by alkyl of 1–6 carbon atoms, alkoxy of 1–6 carbon atoms or trifluoromethyl; or R^1 and R^2 taken together, or R^2 and R^3 taken together, form a 5, 6 or 7 membered carbocyclic ring which may be saturated or unsaturated, and when R^1 and R^2 form a ring the ring has the same number of carbon atoms as the ring carrying X; R^4 and R^5 may also represent alkoxy of 1–6 carbon atoms; n is 1, 2 or 3 and X is CN, $CONH_2$ or $CSNH_2$; which process comprises treating, in a reaction medium comprising an ether solvent, a compound of formula II



wherein R^1, R^2, R^3, R^4, R^5 and n are as defined in connection with formula I, and M is sodium, potassium, lithium, or MgHal, where Hal is chlorine, bromine or iodine, with a silyl compound of formula III, $R_x^aSi(NCY)_{4-x}$ wherein R^a is alkyl of 1–10 carbon atoms, cycloalkyl of 4–8 carbon atoms, phenylalkyl of 7–12 carbon atoms or phenyl, at least one group R^a being a branched chain alkyl of 3–10 carbon atoms, cycloalkyl of 4–6 carbon atoms, phenyl or branched chain phenylalkyl of 8–12 carbon atoms, Y is oxygen or sulphur, x has a value from 1 to 3, then subjecting the product to hydrolysis or alcoholysis with the proviso that when a compound of formula I in which X is CN is desired the molar ratio of compound $R_x^aSi(NCY)_{4-x}$ to compound II is at least 2:1 and x is 3 and Y is S and if desired isolating the product as an acid addition salt.

4,526,971

PROCESS FOR THE PRODUCTION OF POLYALKYLPIPERIDYLAMINES

Josef Disteldorf, Herne; Manfred zur Hausen, Marl; Werner Hübel, and Gunter Kriebel, both of Herne, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

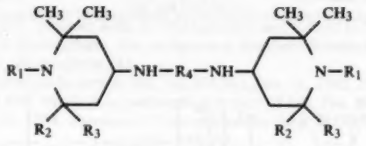
Filed Mar. 30, 1984, Ser. No. 595,555

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1983, 3321332

Int. Cl.³ C07D *401/12, 211/58*

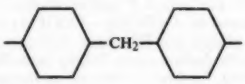
U.S. Cl. 546—186 **13 Claims**

1. A process for producing polyalkylpiperidylamines of the formula (I):

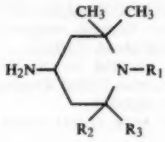


(I)

wherein R_1 is hydrogen or a C_1–C_{12} alkyl radical; R_2 and R_3 are each C_1–C_5 alkyl radicals or R_2 and R_3, taken together are $-(CH_2)_a-$ or $-CH_2-C(CH_3)_2-NR_1-C(R_5,R_6)-CH_2-$; R_4 is a C_2–C_{18} alkylene radical, which is unsubstituted or substituted by C_1–C_3 alkyl; a C_5–C_{12} cycloalkylene radical, which is unsubstituted or is methyl-substituted; a cycloalkylene radical of the formula



where the cyclohexyl rings are unsubstituted or are methyl-substituted; or groups of the formula $-(CH_2)_k-X-[(CH_2)_m-X]_n-(CH_2)_p$, where X is —O—, —NH—, —NR_5— and R_5 and R_6 are each a C_1–C_5 alkyl radical and a is 4 or 5, k is 2 or 3, m is 2 or 3, n is 0–3 and p is 2 or 3; which process comprises reductively alkylating an alkylated 4-aminopiperidine of the formula (II);



(II)

with a difunctional alcohol of the formula HO—R_4—OH, wherein R_1, R_2, R_3 and R_4 have the above definitions.

4,526,972

ULTRAVIOLET LIGHT STABILIZING STERICALLY HINDERED POLYOXYALKYLENE AMINES

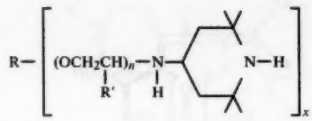
George P. Speranza, Austin, and Robert A. Grigsby, Jr., Georgetown, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 27, 1984, Ser. No. 624,894

Int. Cl.³ C07D *401/12, 211/58*

U.S. Cl. 546—191 **20 Claims**

1. A compound having the formula:



(I)

wherein:

R represents an alkylene, alkyl, aralkyl, alkaryl or aryl group containing 1 to 24 carbon atoms,

R′ represents hydrogen, methyl or ethyl,

n represents a number having an average value of 1 to 70, and

x represents an integer having a value of 1 to 3.

4,526,973

CHEMICAL COMPOUNDS

Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

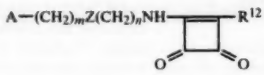
Division of Ser. No. 369,971, Apr. 21, 1982, , which is a continuation-in-part of Ser. No. 264,533, May 18, 1981, Pat. No. 4,390,701. This application Jun. 9, 1982, Ser. No. 386,566

The portion of the term of this patent subsequent to Jul. 26, 2000, has been disclaimed.

Int. Cl.[3] **C07D** *211/06, 295/10*

U.S. Cl. 546—235 **9 Claims**

1. A compound of the formula



III

wherein

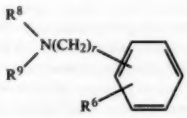
R^{12} is a conventional leaving group selected from halogen, phenoxy, substituted phenoxy and alkoxy;

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is sulfur, oxygen or methylene; and

A is



in which

R^6 is hydrogen, (lower)alkyl, (lower)alkoxy or halogen;

r is an integer of from 1 to 4 inclusive; and

R^8 and R^9 each are independently hydrogen, (lower)alkyl, allyl, propargyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, cyclo(lower)alkyl, or phenyl(lower)alkyl, provided that R^8 and R^9 may not both be cyclo(lower)alkyl, or R^8 and R^9, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, piperidino, methylpiperidino, dimethylpiperidino, hydroxypiperidino, 1,2,3,6-tetrahydropyridyl, 3-pyrrolino, homopiperidino, heptamethyleneimino, octamethyleneimino or 3-azabicyclo[3.2.2]nonane; with the proviso that $A—(CH_2)_mZ(CH_2)_n—$ may not be the 3-(3-piperidinomethylphenoxy)propyl moiety.

4,526,974

SYNTHESIS OF 2-PYRIDYLALKYLAMINES

Brian M. Adger, Hildenborough, Nr. Tonbridge, England, and Antonietta R. Mastrocola, Bala Cynwyd, Pa., assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

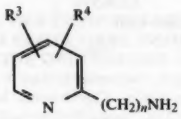
Filed Mar. 22, 1983, Ser. No. 477,036

Claims priority, application United Kingdom, Mar. 25, 1982, 8208750; May 20, 1982, 8214723

Int. Cl.[3] **C07D** *213/38*

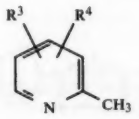
U.S. Cl. 546—329 **10 Claims**

1. A process for preparing a compound of formula (II):



(II)

where R^3 and R^4 are the same or different and are hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, amino or nitro and n is 3 or 4 which comprises reacting an alkali metal derivative of a compound of furmula (III):



(III)

where R^3 and R^4 are as defined with reference to formula (II) with a compound of formula (IV):

$$X(CH_2)_{(n-1)}NH_2 \quad \text{(IV)}$$

which is used in the form of an acid addition salt thereof, where n is defined with reference to formula (II) and X is halogen, in the presence of a non-interfering solvent, and thereafter optionally converting the compound of formula (I) so obtained into a salt.

4,526,975

2-AMINO-4-(4-PYRIDINYL)BENZOIC ACIDS

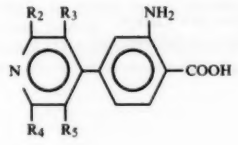
Venkataraman Ramachandran, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 8, 1983, Ser. No. 511,854

Int. Cl.[3] **C07D** *211/70, 215/16*

U.S. Cl. 546—335 **9 Claims**

1. A compound corresponding to the formula:



wherein R_2, R_3, R_4, and R_5 are independently selected from hydrogen, halo, and halogenated and unhalogenated phenyl and phenoxy substituents.

3. A process which comprises heating a reaction mixture consisting essentially of a 4-(4-methyl-3-nitrophenyl)pyridine and an alcoholic base at reflux temperatures so as to produce a 2-amino-4-(4-pyridinyl)benzoic acid.

8. In a process for preparing a 1-alkyl-1,4-dihydro-4-oxo-7-pyridinyl-3-quinolinecarboxylic acid by (a) converting a 2-amino-4-(4-pyridinyl)benzoic acid to a 4-(4-pyridinyl)isatoic anhydride, (b) N-alkylating the 4-(4-pyridinyl)isatoic anhy-

dride, (c) reacting the resultant N-alkyl-4-(4-pyridinyl)isatoic anhydride with an alkali metal salt of an alkyl formyl acetate to form an alkyl 1-alkyl-1,4-dihydro-4-oxo-7-pyridinyl-3-quinolinecarboxylate, and (d) hydrolyzing the carboxylate, the improvement which comprises preparing the 2-amino-4-(4-pyridinyl)benzoic acid by heating a reaction mixture consisting essentially of a 4-(4-methyl-3-nitrophenyl)pyridine and an alcoholic base at reflux temperatures.

4,526,976
THIENO[3,2-B]BENZOFURAN AND BENZOTHIOPHENE DERIVATIVES USEFUL AS OPTICAL BRIGHTENING AGENTS

Fritz Fleck, Bottmingen, Switzerland; Alec V. Mercer, Bramhope, and Malcolm Oates, Cleckheaton, both of England, assignors to Sandoz Ltd., Basel, Switzerland

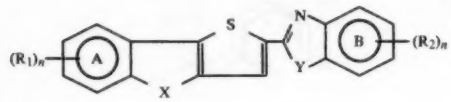
Filed Mar. 30, 1983, Ser. No. 480,221

Claims priority, application United Kingdom, Apr. 6, 1982, 8210225

Int. Cl.³ C07D *495/04*

U.S. Cl. 548—159 **10 Claims**

1. A compound of formula Ia



Ia

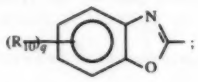
in which

X is O or S;

Y is O, S or NR_3,

each n independently is 0, 1, 2 or 3;

each R_1, independently, and each R_2, independently, is C_{1-4}alkyl; halogen; C_{1-4}-alkoxy; $-CONH_2$; nitrile; $COOR_3$; methylsulphonyl; or phenyl unsubstituted or monosubstituted by chlorine, C_{1-4}alkyl or C_{1-4}-alkoxy; or, when n=2, both R_1's and/or both R_2's may be ortho to each other and together form a benzo ring fused to ring A and/or ring B, respectively, which benzo ring is unsubstituted or monosubstituted by a group R_{10}; or, when n=1, R_1 and/or R_2 may be a group (a)



(a)

R_3 is hydrogen or C_{1-4}alkyl;

R_{10} is C_{1-4}alkyl or halogen; and

q is 0 or 1.

4,526,977
2-(3-AMINO-5-ISOXAZOLYL)-2-OXYIMINO-ACETIC ACIDS

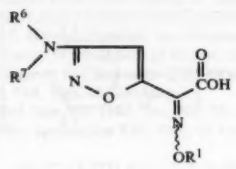
Thomas J. Commons, Wayne, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 309,361, Oct. 7, 1981, Pat. No. 4,394,504. This application Apr. 7, 1983, Ser. No. 470,693

Int. Cl.³ C07D *261/06*

U.S. Cl. 548—246 **4 Claims**

1. A compound of the formula:



in which:

R^1 is H, alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms, arylalkyl of 7 to 10 carbon atoms, 2-carboxyprop-2-yl, carboxymethyl, alkanoyl of 2 to 4 carbon atoms or α-phenylalkanoyl of 8 to 10 carbon atoms; and

R^6 and R^7 are, taken individually or together, hydrogen or an amino protecting group.

4,526,978
PROCESS FOR PREPARING 1-H-TETRAZOLE-5-THIOLS AND INTERMEDIATE COMPOUNDS

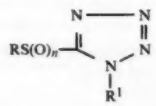
Dieter H. Klaubert, Perkiomenville, and John H. Sellstedt, Pottstown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 939,517, Sep. 5, 1978, abandoned. This application Aug. 29, 1980, Ser. No. 182,728

Int. Cl.³ C07D *257/04*

U.S. Cl. 548—251 **3 Claims**

1. A 5-sulfinyl or sulfonyl-1-H-tetrazole compound of the formula:



in which

n is 1 or 2;

R is phenyl or phenyl substituted with a halogen, a lower alkyl group, or a lower alkoxy group; or a saturated alicyclic hydrocarbon group having 5–10 carbon atoms, and

R^1 is hydrogen; lower alkyl; lower alkyl substituted with a carboxylic acid group, a carboxylic acid lower alkyl ester group, or an hydroxy group; phenyl or phenyl substituted with a halogen, a lower alkyl group, or a lower alkoxyl group; benzyl or benzyl substituted with a halogen, a lower alkyl group, or 1–3 alkoxy groups of 1–3 carbon atoms; or trichloroethyl,

wherein lower alkyl and lower alkoxy refers to such groups having 1–6 carbon atoms.

4,526,979
CARBAMATES AND OXALAMIDES OF AMINO-N-(1H-TETRAZOL-5-YL)BENZAMIDES

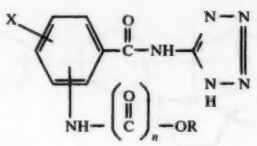
Norton P. Peet, and Shyam Sunder, both of Indianapolis, Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jul. 22, 1983, Ser. No. 517,085

Int. Cl.³ C07D *257/06*

U.S. Cl. 548—251 **9 Claims**

1. A compound of the formula:



wherein n is 1 or 2; X is hydrogen or chlorine; and R is alkyl of 1–6 carbon atoms; and the pharmaceutically acceptable salts thereof.

4,526,980

METHOD FOR THE PREPARATION OF TETRANITRODIBENZOTETRAZAPENTALENE

Marguarite S. Chang, Oxon Hill, and Robert R. Orndoff, Waldorf, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1983, Ser. No. 511,366
Int. Cl.³ C07D *257/10*
U.S. Cl. 548—258 **6 Claims**

1. A method for preparing tetranitrodibenzo-1,3a,4,6a-tetrazapentalene which comprises:

refluxing stoichiometric amounts of o-diaminobenzene and lead dioxide in ethyl acetate to form diaminoazobenzene;

isolating diaminoazobenzene;

forming a turbulent suspension of diaminoazobenzene, a concentrated acid selected from the group consisting of hydrochloric acid and sulfuric acid, and water at a temperature from about −5° to about 5° C. by high-shear mixing;

admixing with said suspension a nitrite selected from the group consisting of sodium and potassium nitrite to form nitrous acid in said suspension;

admixing with said suspension an aqueous solution of an azide selected from the group consisting of sodium, lithium, and potassium azide at a temperature from about 5° to 10° C.;

high-shear mixing said suspension to maintain turbulent conditions until said suspension reaches room temperature, thereupon formation of diazidoazobenzene being substantially complete;

isolating diazidoazobenzene;

forming a suspension of diazidoazobenzene in decalin;

heating said decalin suspension until nitrogen begins to evolve;

slowly increasing the temperature of said decalin suspension at a rate from about 0.5° to about 2° C. per minute to a temperature from about 160° C. to about 190° C.;

continuing to heat said suspension until nitrogen ceases evolving, thereupon formation of dibenzotetrazapentalene being substantially complete;

isolating dibenzotetrazapentalene;

forming a suspension of dibenzotetrazapentalene and a concentrated solution of sulfuric acid;

slowly adding said pentalene-acid suspension to fuming nitric acid at a temperature from about −5° C. to about 5° C.;

heating said pentalene-acid suspension to a temperature from about 55° to about 65° C. until the formation of tetranitrodibenzo-1,3a,4,6a-tetrazapentalene is complete; and

isolating tetranitrodibenzo-1,3a,4,6a-tetrazapentalene.

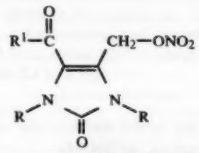
4,526,981

[1,2-DIHYDRO-4(5)-ACYL-2-OXO-2H-IMIDAZOL-4(5)-YL] METHYL NITRATES

J. Martin Grisar, Wissembourg, France; Richard A. Schnettler, and Richard C. Dage, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 260,448, May 4, 1981, abandoned. This application Apr. 29, 1983, Ser. No. 489,972
Int. Cl.³ C07D *233/64*
U.S. Cl. 548—321 **5 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl of 1–4 C, lower alkanoyl of 2–4 C, or benzoyl; R^1 is lower alkyl of 1–4 C, phenyl, halophenyl, methylphenyl, methoxyphenyl, methylsulfonylphenyl, dimethylaminophenyl, dimethoxyphenyl, 3,4-methylenedioxyphenyl, 2-furyl, 2-thienyl or pyridyl.

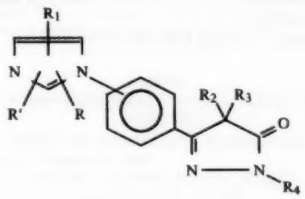
4,526,982

2,4-DIHYDRO-5-[(SUBSTITUTED)PHENYL]-4,4-DISUBSTITUTED-3H-PYRAZOL-3-ONES

Glenn C. Morrison, 1445 Arlington, Ann Arbor, Mich.

Filed May 23, 1983, Ser. No. 497,316
Int. Cl.³ C07D *403/10*
U.S. Cl. 548—336 **3 Claims**

1. A compound of the formula



wherein R_2, R_3, and R_4 are independently hydrogen or alkyl of from one to six carbon atoms, R_1, R′, and R are independently hydrogen, —CH_2OH, alkyl of from one to six carbon atoms, or alkoxy of from one to six carbon atoms, and the pharmaceutically acceptable salts thereof.

2. 2,4-dihydro-5-[4-(1H-imidazol-1-yl)phenyl]-4,4-dimethyl-3H-pyrazol-3-one or a pharmaceutically acceptable salt thereof.

4,526,983

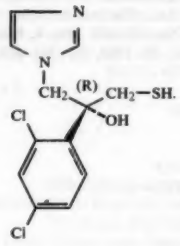
PROCESS FOR PREPARING OPTICALLY ACTIVE IMIDAZOLYLPROPANOL COMPOUNDS, AND INTERMEDIATE THEREIN

Ikutaro Saji, Suita; Renzo Sato, Takarazuka; Noritaka Hanma, Sakai, and Yasuo Motoike, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 24, 1983, Ser. No. 497,579
Int. Cl.³ C07D *233/54*
U.S. Cl. 548—341 **11 Claims**

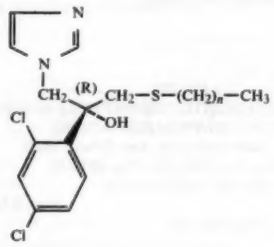
1. An imidazolylthiol of the formula:

(II)



2. A process for preparing optically active imidazolylpropanol compounds of the formula:

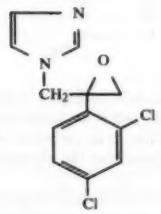
(I)



wherein n is an integer of 3 or 4, and their acid addition salts, which comprises:

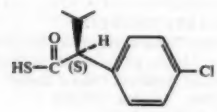
(1) reacting a racemic exposide of the formula:

(IV)



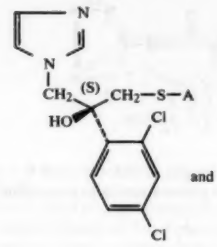
with an optically active thiolocarboxylic acid of the formula

(V)



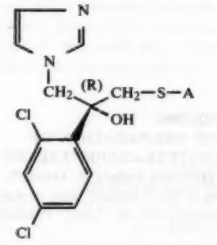
to give a mixture of two diastereomeric isomers of the formulas:

(VIa)



and

(VIb)

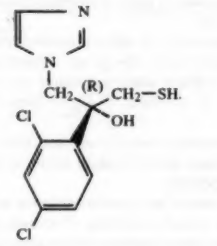


wherein A is as defined above;

(2) separating the (R)-isomer from said mixture; and

(3) reacting the (R)-isomer with a base to give an imidazolylthiol of the formula:

(II)



4,526,984

AUTOXIDATION OF ALKYL-SUBSTITUTED AROMATIC ETHERS

Visweswara R. Durvasula, Cheshire, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

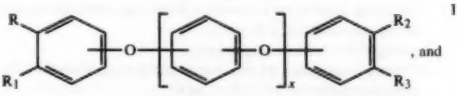
Filed Oct. 29, 1984, Ser. No. 665,905

Int. Cl.[3] **C07D** *307/89*

U.S. Cl. 549—241 **15 Claims**

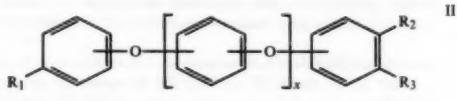
1. A method for converting an aromatic compound selected from the formulae consisting of

I

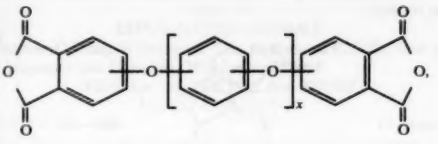


, and

II

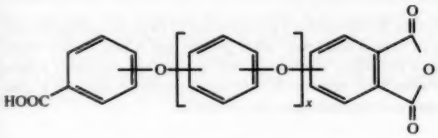


to the corresponding anhydrides having the formulae



III

and



IV

wherein R, R_1, R_2, and R_3 are independently selected from linear lower alkyl and x is 0, 1, or 2, said method comprising autoxidizing in a first step said aromatic compound in a solution comprising an aliphatic monocarboxylic acid having 2 to 8 carbon atoms with oxygen in the presence of a heavy metal oxidation catalyst and a promoter to form a partially oxidized reaction mixture, and in a second step adding an anhydride of an aliphatic monocarboxylic acid having 3 to 8 carbon atoms, and continuing the autoxidation reaction at a temperature of at least 130° C. to form said anhydride.

4,526,985

PROCESS FOR THE PREPARATION OF THE ANHYDRIDE OF N-FORMYL-L-ASPARTIC ACID

Vincenzo Giobbio, Turin; Giorgio Ornato; Livio Buracchi, both of Ivrea, and Alberto Mangia, Milan, all of Italy, assignors to Pierrel S.p.A., Napoli, Italy

Filed Jul. 18, 1983, Ser. No. 514,585
Claims priority, application Italy, Aug. 6, 1982, 22763 A/82
Int. Cl.³ C07D *307/66*
U.S. Cl. 549—253 **1 Claim**

1. A process for the preparation of the anhydride of N-formyl-L-aspartic acid which consists of adding slowly, during a period of 5–8 hours, formic acid to the mixture of L-aspartic acid and acetic anhydride, in the respective amounts of 2.00–2.10 moles of acetic anhydride and 1.00–1.10 moles of formic acid per mole of aspartic acid at a temperature of up to 35° C., in the absence of a solvent, letting the reaction mixture stand for a period of 48–60 hours and isolating said anhydride of N-formyl-L-aspartic acid from the reaction mixture.

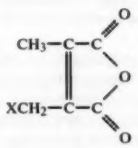
4,526,986

HALOMETHYL, METHYL MALEIC ANHYDRIDE AND SYNTHESIS OF BROMOMETHYL, METHYL MALEIC ANHYDRIDE

Ellis K. Fields, River Forest, and Mark L. Winzenburg, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

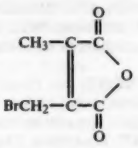
Filed Apr. 13, 1983, Ser. No. 484,541
Int. Cl.³ C07D *307/60*
U.S. Cl. 549—254 **3 Claims**

1. A composition of the structural formula:



wherein X is halogen.

3. A method of preparing methyl bromomethylmaleic anhydride of the structural formula



wherein said anhydride is prepared by reacting dimethylmaleic anhydride with bromotrichloromethane in the presence of actinic radiation, and recovering said anhydride by distilling at a temperature of from about 100° to about 106° C. and from about 0.2 to about 0.3 mm Hg.

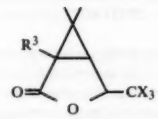
4,526,987

ALKYL 6,6-DIMETHYL-2-OXO-3-OXABICYCLO[3.1.0]HEXANE-1-CARBOXYLATES

Kiyoshi Kondo, Yamato; Toshiyuki Takashima, Ebina, and Daiei Tunemoto, Sagamihara, all of Japan, assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 875,649, Feb. 6, 1978, abandoned. This application Jan. 3, 1979, Ser. No. 736
Int. Cl.³ C07D *307/77*
U.S. Cl. 549—305 **4 Claims**

1. A compound of the formula



wherein each X is the same or different and is a chlorine or bromine atom, and R_3 is lower alkoxycarbonyl.

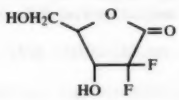
4,526,988

DIFLUORO ANTIVIRALS AND INTERMEDIATE THEREFOR

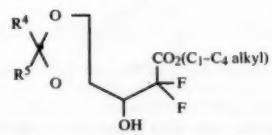
Larry W. Hertel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 10, 1983, Ser. No. 473,883
Int. Cl.³ C07D *307/32*
U.S. Cl. 549—313 **3 Claims**

1. A process for preparing a lactone of the formula



which process comprises hydrolyzing, under very mild conditions, an alkyl 3-dioxolanyl-2,2-difluoro-3-hydroxypropionate of the formula



wherein R^4 and R^5 are independently C_1–C_3 alkyl.

4,526,989

1,4-BIS (SUBSTITUTED-AMINO)-5,8-DIHYDROXY-ANTHRAQUINONES AND LEUCO BASES THEREOF

Keith C. Murdock, Pearl River, N.Y., and Frederick E. Durr, Ridgewood, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 923,602, Jul. 11, 1978, Pat. No. 4,197,249, which is a continuation-in-part of Ser. No. 873,040, Jan. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 824,872, Aug. 15, 1977, abandoned. This application Oct. 23, 1979, Ser. No. 87,354

Int. Cl.[3] **C07C** *97/24;* **A61K** *31/125*

U.S. Cl. 549—316 **17 Claims**

1. A compound selected from the group consisting of 1,4-bis[(2-aminoethyl)amino]-5,8-dihydroxyanthraquinone, the leuco base and tautomer thereof, and the pharmacologically acceptable acid-addition salts thereof.

17. The acid-addition salt of the leuco base according to claim 1 wherein the acid is ascorbic acid.

4,526,990

SYNTHESIS OF γ-VINYL-γ-BUTYROLACTONE FROM ACETOXYHEXENOIC ACIDS

James P. Coleman; Richard C. Hallcher, both of Maryland Heights; Thomas E. Rogers, Manchester, and Dudley E. McMackins, St. Charles, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 13, 1983, Ser. No. 503,979

Int. Cl.[3] **C07D** *307/32;* **C07C** *67/05*

U.S. Cl. 549—326 **17 Claims**

1. A process for preparing γ-vinyl-γ-butyrolactone in which butadiene and acetic acid are reacted in the presence of metal ion oxidants to produce acetoxyhexenoic acids, and the reaction mixture in a subsequent stage is treated to convert acetoxyhexenoic acids to γ-vinyl-γ-butyrolactone, and in which γ-vinyl-γ-butyrolactone-containing reaction mixture is recycled to the stage in the process producing acetoxyhexenoic acids.

4,526,991

2,6-DIOXA-BICYCLO-[2,2,2]-OCTANE-7-YL-ACETALDEHYDES

Peter W. Thies, and Samuel David, both of Hanover, Fed. Rep. of Germany, assignors to Kali-Chemie Ag, Hanover, Fed. Rep. of Germany

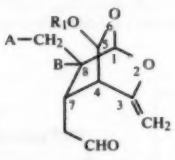
Filed Sep. 24, 1984, Ser. No. 653,708

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335827

Int. Cl.[3] **C07D** *319/14*

U.S. Cl. 549—363 **12 Claims**

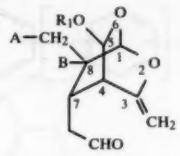
1. A compound corresponding to the formula:



I

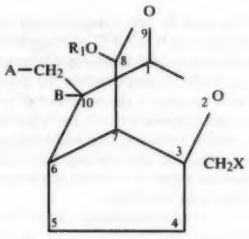
wherein R_1 represents a group selected from the group consisting of benzyl and lower alkyl groups and A and B each represent a hydrogen atom or A and B together represent a bond between their respective carbons.

7. A method for producing a compound corresponding to the formula:



I

wherein R_1 represents a group selected from the group consisting of benzyl and lower alkyl groups and A and B each represent a hydrogen atom or A and B together represent a bond between their respective carbons comprising reacting a compound corresponding to the formula:



II

OR

wherein R_1, A and B have the meanings defined above, X represents a halogen atom selected from the group consisting of bromine and iodine, and R represents a hydrogen atom or a lower acyl group, with a base in the presence of a solvent.

4,526,992

SYNTHESIS OF SUBSTITUTED DIOXOLANES BY DIRECT OXIDATION OF OLEFINS OVER MOLYBDENUM 8-HYDROXYQUINOLINE

Jiang-Jen Lin, Round Rock, and John R. Sanderson, Austin, both of Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Oct. 18, 1984, Ser. No. 662,316

Int. Cl.[3] **C07D** *317/00*

U.S. Cl. 549—430 **12 Claims**

1. A process for the synthesis of dioxolanes via direct oxidation comprising

reacting an olefin with oxygen in the presence of water and a molybdenum 8-hydroxyquinoline catalyst to produce substituted dioxolanes.

8. A process for the synthesis of dioxolanes via direct oxidation comprising

reacting an olefin having 3 to 18 carbon atoms with oxygen in the presence of water, chlorobenzene and a molybdenum 8-hydroxyquinoline catalyst at a temperature in the range of 100° to 250° C. and at a pressure in the range of 50 to 1,000 psi to produce substituted dioxolanes.

12. A process for the synthesis of dioxolanes via direct oxidation comprising

reacting an olefin selected from the group consisting of propylene and 2-butene with oxygen in the presence of 1 to 50 wt.% water, chlorobenzene and 10 to 1,000 ppm, based on the olefin, of a molybdenum 8-hydroxyquinoline catayst at a temperature in the range of 130° to 250° C. and at a pressure in the range of 50 to 1,000 psi to give a selectivity to the substituted dioxolanes of at least 40%.

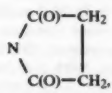
4,526,993

CONJUGATED DIENOLS

Chaucer C. Tang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

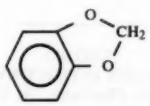
Filed Apr. 30, 1982, Ser. No. 373,703
Int. Cl.³ C07D *317/00*
U.S. Cl. 549—445 **18 Claims**

1. Process for preparing the conjugated dienol having the formula $R^1CR^2{=}CR^3CR^4{=}CHCH_2OH$ which comprises contacting and reacting an activated conjugated dienoic acid ester having the formula $R^1CR^2{=}CR^3CR^4{=}CHC(O)OY$, with an alkali metal borohydride at about −5° to +35° C. for a time sufficient to effect reaction, wherein said formulae R^1–R^4 are, independently, H, C_{1-4} alkyl, or optionally substituted phenyl, Y is $X(O)(OR)_n$ or



X is carbon or phosphorus, R is H, C_{1-4} alkyl or optionally substituted phenyl and n is 1 when X is carbon and 2 when X is phosphorus.

3. Process of claim 1 wherein Y is $C(O)OC_2H_5$, R^1 is CH_3, C_6H_5 or



and R^2–R^4 are H.

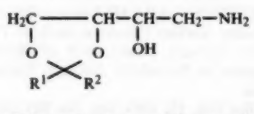
4,526,994

2-AMINO-1-(1,3-DIOXOLAN-4-YL)-ETHANOL COMPOUNDS, THEIR PREPARATION AND USE

Ulrich Niedballa, and Heinz Gries, both of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Dec. 20, 1982, Ser. No. 451,375
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150917
Int. Cl.³ C07D *317/00, 317/72*
U.S. Cl. 549—451 **7 Claims**

1. A 2-amino-1-(1,3-dioxolan-4-yl)ethanol compound of the formula



wherein R^1 and R^2 are identical or different and each is hydrogen or alkyl of 1–4 carbon atoms; or when one is alkyl of 1–4 carbon atoms, the other can also be alkoxy of 1–4 carbon atoms; or R^1 and R^2 together form alkylene of 5 or 6 carbon atoms.

7. A method of preparing 5-[N-(2-hydroxyethyl)-acetylamino]-2,4,6-triiodoisophthalic acid bis(2,3,4-trihydroxybut-1-yl)diamide comprising, reacting 5-acetylamino-2,4,6-triiodoisophthalic acid or acid dichloride with a 2amino-1-(1,3-dioxolan-4-yl)ethanol of claim 1 and cleaving the OH blocking groups on the portion derived from 2-amino-1-(1,3-dioxolan-4-yl)ethanol followed by reacting the resultant 5-acetylamino-2,4,6-triiodoisophthalic acid bis(2,3,4-trihydroxybutyl) diamide with 2-chloroethanol.

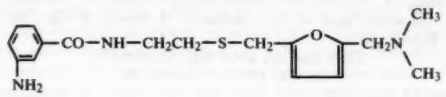
4,526,995

3-AMINO-N-[2-(5-DIMETHYLAMINOMETHYLFURAN-2-YLMETHYLTHIO)ETHYL]BENZAMIDE INTERMEDIATE

Dino Nisato, Pavia, and Sergio Boveri, Tortona, both of Italy, assignors to Sanofi, Paris, France

Division of Ser. No. 511,107, Jul. 6, 1983, Pat. No. 4,492,711. This application Jul. 26, 1984, Ser. No. 634,569
Claims priority, application France, Aug. 13, 1982, 82 14125
Int. Cl.³ C07D *307/54*
U.S. Cl. 549—494 **1 Claim**

1. The 3-amino-N-[2-(5-dimethylaminomethylfuran-2-ylmethylthio)ethyl]benzamide of formula



or an acid addition salt thereof.

4,526,996

PROCESS FOR THE PREPARATION OF N-SUBSTITUTED AMINOALKYLSILANES

John A. Kilgour, Putnam Valley, N.Y., and Herbert E. Petty, Bethel, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 19, 1984, Ser. No. 622,176
Int. Cl.³ C07F *7/10*
U.S. Cl. 556—413 **17 Claims**

1. A process for selectively preparing an N-substituted aminoalkylsilane which comprises reacting a primary or secondary amine with a cyanoalkylsilane in the presence of hydrogen gas and a heterogeneous hydrogenation catalyst selected from the group consisting of rhodium, platinum and palladium.

4,526,997

ANTICOCCIDIAL COMBINATIONS COMPRISING POLYETHER ANTIBIOTICS AND CARBANILIDES

George O. P. O'Doherty, Greenfield, and Albert J. Clinton, Indianapolis, both of Ind.

Division of Ser. No. 260,962, May 6, 1981, Pat. No. 4,468,380, which is a continuation of Ser. No. 107,304, Dec. 26, 1979, abandoned. This application May 18, 1984, Ser. No. 611,780
Int. Cl.³ C07C *127/19, 79/46*
U.S. Cl. 560—21 **12 Claims**

1. A compound selected from a group consisting of:
2-amino-3-nitro-5-(trifluoromethyl)-2′,4′-dimethylcarbanilide
2-amino-3,3′-dinitro-5-(trifluoromethyl)-4′-chlorocarbanilide
2-amino-3-nitro-5-(trifluoromethyl)-2′,4′,5′-trichlorocarbanilide
2-amino-3-nitro-5-(trifluoromethyl)-2′-(ethoxycarbonyl)carbanilide
2-amino-3,5′-dinitro-5-(trifluoromethyl)-2′-fluorocarbanilide
2-amino-3,4′-dinitro-5-(trifluoromethyl)-2′-chlorocarbanilide
2-amino-3-nitro-3′,5-bis(trifluoromethyl)-4′-chlorocarbanilide
2-amino-3-nitro-3′,5,5′-tris(trifluoromethyl)carbanilide
2-amino-3-nitro-2′,5-bis(trifluoromethyl)-4′-chlorocarbanilide
2-amino-3-nitro-5-trifluoromethyl-2′-methyl-4′-bromocarbanilide
2-amino-3-nitro-5-(trifluoromethyl)-2′,6′-dibromo-4′-fluorocarbanilide

4,526,998

DEODORIZED FORMALIN

Naoyuki Takeuchi, 1876-258 Tantakabayashi, Sumiyoshi-cho, Higa-shinada-ku, Kobe, Hyogo, Japan

Filed Aug. 17, 1984, Ser. No. 641,695
Claims priority, application Japan, Aug. 18, 1983, 58-152255
Int. Cl.³ C07C *45/86*
U.S. Cl. 568—422 **9 Claims**

1. Deodorized formalin produced by mixing formalin with additives comprising methyl salicylate and ethanol and completely dissolving the additives therein.

4,526,999

LIPOXYGENASE INHIBITORS

Philippe L. Durette, New Providence, and Timothy F. Gallagher, Metuchen, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

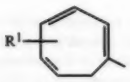
Filed Apr. 25, 1983, Ser. No. 488,497
Int. Cl.³ C07C *35/20, 43/18*
U.S. Cl. 514—549 **7 Claims**

1. Compounds having the formula:

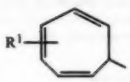
I

wherein:

represents either of:



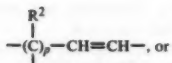
or



;

and:

X is



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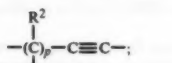
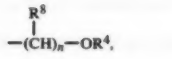


;

Y is



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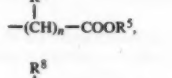

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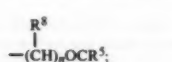

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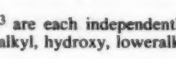


;

R^1, R^2 and R^3 are each independently: hydrogen, halogen, loweralkyl, alkyl, hydroxy, loweralkoxy, amino, monoloweralkyl substituted amino, diloweralkyl substituted amino, aralkyl, aralkyl substituted with one or more R^9, phenyl, phenyl substituted with one or more R^9;

R^4 is hydrogen, lower alkyl;

R^5 is C_1–C_7alkyl;

R^6, R^7 and

R^8 are each independently hydrogen or C_1–C_6 loweralkyl;

R^9 is alkyl, halogen, hydroxy, loweralkoxy, amino, nitro, trihaloalkyl;

n is an integer of from 1–10;

p is an integer of from 0–4; and pharmaceutically acceptable salts thereof.

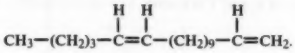
4,527,000

DIOLEFIN PHEROMONE MIMICS AS DISRUPTANTS OF SEXUAL COMMUNICATION IN INSECTS

David A. Carlson, and John R. McLaughlin, both of Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 14, 1983, Ser. No. 474,996
Int. Cl.³ C07C *9/22*; C07B *53/08*
U.S. Cl. 585—16 **4 Claims**

1. Diolefin insect pheromone mimic (Z)-1,12-heptadecadiene:



4,527,001

SMALL OLEFIN INTERCONVERSIONS

Steven W. Kaiser, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 15, 1983, Ser. No. 551,888
Int. Cl.³ C07C *3/16, 3/32, 5/22*
U.S. Cl. 585—643 **17 Claims**

1. Process for the interconversion of ethylene, propylene and butenes comprising contacting an olefin feed containing at least one of ethylene, propylene and butenes with at least one molecular sieve selected from the group consisting of the SAPOs of U.S. Pat. No. 4,440,871 and the $AlPO_4$s of U.S. Pat. No. 4,310,440 characterized by an adsorption for n-hexane of more than 2 percent by weight at 400 torr and at 24.0° C. and by an adsorption for isobutane of less than 2 percent by weight at a pressure of 100 torr and a temperature of 24° C., at effective olefin interconversion conditions for forming small olefin products.

4,527,002

THERMAL CRACKING METHOD FOR PRODUCING OLEFINES FROM HYDROCARBONS

Makoto Kamisaka; Toshiro Okamoto, both of Tokyo; Michio Ohshima, and Mamoru Tamai, both of Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,256
Claims priority, application Japan, Feb. 18, 1984, 58-25797
Int. Cl.³ C07C *4/04*
U.S. Cl. 585—648 **4 Claims**

1. A thermal cracking method for producing olefines from hydrocarbons which comprises burning hydrocarbon with oxygen in the presence of steam to produce a high-temperature gas containing steam of 1500°–3000° C., supplying methane and hydrogen into said high-temperature gas containing steam, with the mol ratio of methane to hydrogen in said high temperature gas being from about 0.05 to about 4.0, then supplying hydrocarbon to be cracked into said high-temperature gas containing said methane, hydrogen and steam, thermally cracking said hydrocarbon under conditions of partial pressure of hydrogen of more than at least 0.1 bar at the outlet of a

reaction vessel, temperature, 800°–1200° C. and residence time, 5–300 milli-seconds, and rapidly cooling the reaction product thus obtained.

4,527,003

THERMAL CRACKING PROCESS FOR PRODUCING OLEFINS FROM HYDROCARBONS

Toshiro Okamoto, Tokyo, and Michio Ohshima, Hiroshima, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 583,939
Claims priority, application Japan, Mar. 3, 1983, 58-34928
Int. Cl.³ C07C *4/04*
U.S. Cl. 585—648 **5 Claims**

1. A thermal cracking process for producing olefins from hydrocarbons which comprises the steps of partially burning a hydrocarbon with less than the theoretical amount of oxygen in the presence of steam to give a hot gas of from 1400° to 3000° C. comprising steam and hydrogen feeding, to the hot gas comprising steam and hydrogen, a mixture of methane and hydrogen so that the methane/hydrogen molar ratio in the hot gas is about 0.05 to about 4.0; further feeding a starting hydrocarbon to the hot gas mixture comprising the methane, hydrogen and steam; subjecting the starting hydrocarbon to thermal cracking while keeping the partial pressure of hydrogen at least 0.1 bar at the outlet of a reactor, the temperature at 800° to 1200° C., and the residence time at 5 to 300 milliseconds; and quenching the resulting reaction product.

4,527,004

PURIFICATION OF OLEFINS BY BORON TRIFLUORIDE-ALCOHOL TREATMENT

William A. Sweeney, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 28, 1982, Ser. No. 382,904
Int. Cl.³ C07C *7/10*
U.S. Cl. 585—851 **9 Claims**

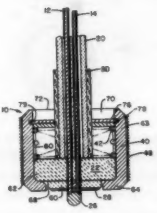
1. A process for purifying predominantly straight chain liquid olefins having from 5 to 50 carbon atoms which comprises contacting the olefins with a liquid solution of boron trifluoride in an alcohol or mixture of alcohols selected from the group consisting of mono and poly hydroxylic aliphatic compounds having from one to five carbon atoms, intimately admixing the liquid olefins and liquid solution of boron trifluoride, separating into two liquid layers, and recovering the olefin layer, under reaction conditions sufficient to minimize the olefinic reactions normally catalyzed by boron trifluoride while recovering an olefin product essentially free of color-forming impurities and impurities which retard or suppress further reaction of the olefins.

4,527,005

SPRING LOADED THERMOCOUPLE MODULE

Thomas E. McKelvey, Solana Beach, and Joseph J. Guarnieri, San Diego, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 13, 1984, Ser. No. 589,253
Int. Cl.[3] H01V *1/02*
U.S. Cl. 136—221 16 Claims



1. A thermocouple arrangement for mounting in a specimen to be monitored, said specimen having a side wall and an end wall therein so as to define a blind hole for mounting said thermocouple arrangement, said thermocouple arrangement comprising;

an elongated thermal insulator member having first and second end portions of predetermined dimensions, shoulder means disposed adjacent said second end portion and dimensioned smaller than said first end portion, first and second passageways extending through said insulator in a direction generally parallel to the longitudinal axis thereof;

a cup-shaped holder member, having a hollow cylindrical wall portion, a first open end and a second end enclosed by a generally disc-shaped end wall member having an aperture formed therein for receiving said shoulder means of said insulator member, said second end portion of said insulator member disposed within said holder member, adjacent said end wall thereof;

spring bias means disposed within said holder for maintaining engagement between said second end portion of said insulator and said end wall of said holder;

first and second thermocouple wires disposed in said first and said second passageways of said thermal insulator and extending beyond said shoulder means, terminating in first and second free ends, respectively;

a spherical thermally conductive bead joining said first and said second free ends to said thermocouple wires together so as to form a spherical thermal contact surface;

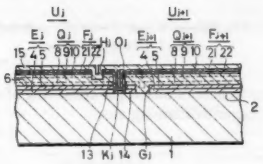
fastening means formed on an outside surface of said holder for engagement with said side wall of said specimen to be monitored, such that when said thermocouple arrangement is fastened to said specimen, said spherical bead contacts said end wall of said blind hole, said shoulder of said insulator member and a portion of said spherical bead recessed within said holder, with said spring bias means maintaining said spherical bead in thermal contact with said end wall of said blind hole.

4,527,006

PHOTOELECTRIC CONVERSION DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Nov. 23, 1983, Ser. No. 554,807
Claims priority, application Japan, Nov. 24, 1982, 57-206806; Nov. 24, 1982, 57-206809; Feb. 22, 1983, 58-28211; Apr. 29, 1983, 58-75713; Oct. 31, 1983, 58-204443
Int. Cl.[3] H01L *31/06*
U.S. Cl. 136—244 9 Claims



1. A photoelectric conversion device comprising:

a substrate having an insulating surface; and

a plurality n (n being an integer larger than one) of semiconductor elements U_1 to U_n sequentially formed thereon side by side and connected in series one after another;

wherein the semiconductor element U_i (i=1, 2, . . . n) has a first electrode E_i formed on the substrate, a non-single-crystal semiconductor laminate member Q_i formed on the first electrode E_i and having formed therein at least one semiconductor junction, and a second electrode F_i formed on the non-single-crystal semiconductor laminate member Q_i in opposing relation to the first electrode E_i;

wherein the second electrode F_{j+1} (j=1, 2, . . . (n−1)) of the semiconductor element U_{j+1} is coupled with the first electrode E_j of the semiconductor element U_j through a coupling portion K_j formed by an extension of the second electrode F_{j+1};

wherein the second electrode F_{j+1} extends on the non-single-crystal semiconductor laminate member Q_i in opposing relation to the first electrode E_j;

wherein the second electrodes F_j and F_{j+1} are separated by an isolating portion H_j; and

wherein the second electrode F_i is formed by a layered member having a conductive metal oxide layer making contact with the non-single-crystal semiconductor laminate member Q_i and a conductive material layer formed on the metal oxide layer where the conductive material layer of the second electrode F_i is a layer formed of chromium or a material consisting principally thereof.

4,527,007

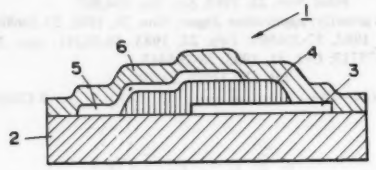
PROCESS FOR FORMING PASSIVATION FILM ON PHOTOELECTRIC CONVERSION DEVICE AND THE DEVICE PRODUCED THEREBY

Mario Fuse, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1984, Ser. No. 573,875
Claims priority, application Japan, Feb. 2, 1983, 58-15832
Int. Cl.[3] H01L *31/04, 31/18*
U.S. Cl. 136—256 6 Claims

6. A photoelectric conversion device having a layer of hydrogenated amorphous silicon between a transparent upper indium-tin oxide electrode and a lower electrode on a substrate, and having a junction between said layer of hydrogenated amorphous silicon and said indium-tin oxide electrode, comprising a silicon oxide film covering the surface of said

photoelectric conversion device formed by the plasma chemical vapor deposition method at a temperature lower than 300° C. in an atmosphere of mixed gas consisting of silane gas and an excess of oxygen-containing gas.

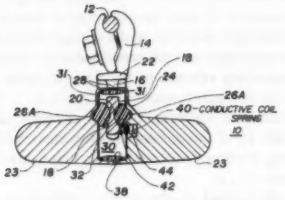


4,527,008

VIBRATION DAMPER FOR OVERHEAD CONDUCTOR

Ronald G. Hawkins, Massena, and Robert M. Hooker, Brushton, both of N.Y., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 23, 1983, Ser. No. 565,180
Int. Cl.³ H02G 7/14
U.S. Cl. 174—42 **8 Claims**



8. A device for damping vibrations of an overhead conductor, comprising:

a member for clamping on the conductor,

elastomer damping elements, and

a weight member attached to the clamping member, said weight member having depressions therein seating the damping elements, said depressions each comprising an inner spherical socket and an outer spherical socket that are concentric with each other.

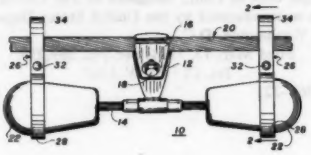
4,527,009

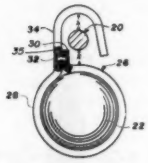
VIBRATION DAMPER WITH MOTION LIMITING FEATURE

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 16, 1984, Ser. No. 601,033
Int. Cl.³ H02G 7/14
U.S. Cl. 174—42 **7 Claims**

1. In a vibration damper comprising a pair of inertia members, one each fixedly supported at the ends of a resilient member, and provided with a clamp engaging the resilient member intermediate the inertia members for attachment of the damper to a suspended conductor subject to aeolian vibration, the improvement comprising a pair of motion limiting means, each of which includes an inverted U-shaped motion limiting clamp having one end thereof rigidly attached to an inertia member and an upper portion dimensioned to loosely anchor about a conductor such that when the damper is attached to a conductor and at rest, the upper portion of the motion limiting clamp extends a predetermined distance above and below the conductor, said predetermined distance being a distance that permits normal damping movement of the inertia member but prevents damaging excessive vertical movement.



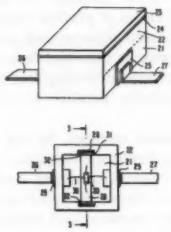


4,527,010

ELECTRONIC PART MOUNTING CONSTRUCTION AND METHOD FOR MANUFACTURING THE SAME

Shinzo Anazawa; Hitoshi Yamada, both of Tokyo; Kuniharu Noda, and Yasuyuki Fujimoto, both of Aichi, all of Japan, assignors to Nippon Electric Co., Ltd. and Narumi China Corporation, both of, Japan

Filed Jul. 30, 1982, Ser. No. 403,443
Claims priority, application Japan, Jul. 31, 1981, 56-120245
Int. Cl.³ H05K 5/06
U.S. Cl. 174—52 FP **12 Claims**



8. An electric part mounting construction comprising a substrate having one principal surface on which an electric part is to be mounted, a wall member mounted on said substrate, said wall member having at least one inside surface intersecting said one principal surface to define a space in which said electric part is to be mounted, said inside surface having a groove formed therein, a metallic layer formed in said groove, and an insulator layer formed on at least a portion of said metallic layer.

4,527,011

CALL CONCENTRATOR WITH AUTOMATIC LINE SUPERVISOR

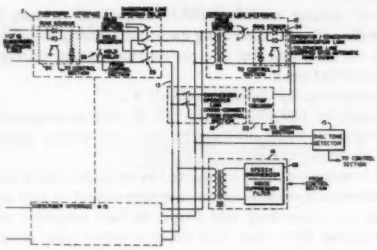
Walter Ziegler, Madison, Wis., assignor to AMTEL Communications, Inc., Madison, Wis.

Filed Apr. 19, 1982, Ser. No. 369,915
Int. Cl.³ H04M 3/50; H04Q 3/60
U.S. Cl. 179—18 FC **8 Claims**

1. A call concentrator for concentrating a plurality of incoming telephone lines onto a single output line which is

adapted to be connected to a telephone tie line equipped with automatic ring-down running between the concentrator and a telephone answering service comprising:

(a) means for detecting a DTMF tone signal on the telephone tie line, such DTMF tone signal being any tone generated signal generated by operation of a conventional push button telephone;



(b) means coupled to the means for detecting for producing a control signal when the signal on the tie line has not been detected for an elapsed time interval; and

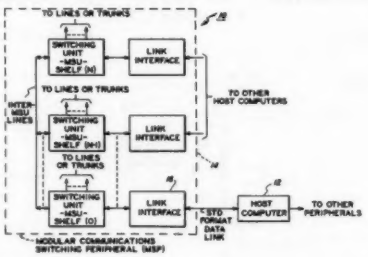
(c) switching means contained within the concentrator having an input which is coupled to the incoming telephone lines and an output which is coupled to the telephone tie line, the switching means opening in response to the control signal to disconnect the concentrator from the incoming telephone lines and the answering service.

4,527,012

COMMUNICATIONS SWITCHING SYSTEM WITH MODULAR SWITCHING COMMUNICATIONS PERIPHERAL AND HOST COMPUTER

Jerome S. Caplan, Henrietta; James W. Delmege, Rochester; Robert R. Laman, Rochester, and Christine Navarro, Rochester, all of N.Y., assignors to Redcom Laboratories Inc., Fairport, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,583
Int. Cl.³ H04Q *3/54*
U.S. Cl. 179—18 ES **10 Claims**



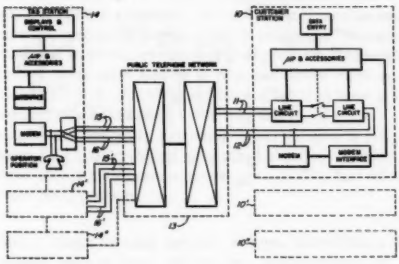
1. A communication switching system which comprises communications switching means having a plurality of ports and effecting switching events at said ports including making connections between a plurality of telephone lines and/or trunks connected to said ports, host computer means for generating digital signal commands having a predetermined structure and corresponding to a plurality of switching events and for receiving digital signal responses also having said predetermined structure and being related to the execution of said switching events at said ports, interface means for linking said computer means and said switching means in communicating relationship for said digital signals, said switching means having processing means responsive to said commands for formatting and scheduling telephone switching data and executing said data for carrying out said switching events at said ports, and said switching means also having means for conveying said commands to said processing means for the ones of said ports at which said switching events are to be carried out for controlling said events exclusively in response to said commands and the state of said ports.

4,527,013

TELEPHONE ANSWERING SYSTEM

Wayne R. Hardy, 55 Selwyn Pl., Kanata, Ontario, Canada K2K 1P1

Filed Sep. 28, 1982, Ser. No. 426,214
Int. Cl.³ H04M *3/50*
U.S. Cl. 179—27 FH **7 Claims**



1. A system for telephone answering service (TAS) comprising:

a plurality of customer stations each having access to first and second telephone lines; and

a TAS station comprising:

(a) TAS storage and control means;

(b) at least one TAS operator position;

(c) at least two incoming telephone lines dedicated to an associated operator position;

(d) switch means for selectively connecting one of said two incoming telephone lines to the associated operator position and to interface means with said TAS storage and control means;

(e) display means at said TAS operator position responsive to said TAS storage and control means for displaying answering phrases stored in customer stations and relayed over said second telephone lines to said TAS storage and control means; and

(f) all said incoming telephone lines being lines of the TAS station's public telephone exchange accessible by means of a single telephone number assigned said TAS station.

4,527,014

LOUDSPEAKING TELEPHONE

Zbigniew B. Styrna, Kanata, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed Sep. 17, 1982, Ser. No. 419,484
Claims priority, application Canada, May 21, 1982, 403582
Int. Cl.³ H04M *9/08*
U.S. Cl. 179—81 B **13 Claims**

1. A loudspeaking telephone circuit comprising,

(a) a microphone,

(b) a loudspeaker,

(c) a hybrid for connection to a telephone line, having an input and an output port,

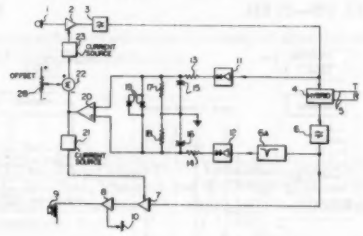
(d) a first variable gain amplifier having its input connected to the microphone and its output connected in a circuit to the input port of the hybrid,

(e) a second variable gain amplifier having its output connected in a circuit to the speaker, and its input connected in a circuit to the output port of the hybrid,

(f) a first rectifier means having first and second poles, said first pole being connected in a circuit to the input port of the hybrid,

(g) a second rectifier means having first and second poles of similar polarity as the first and second poles of the first rectifier means, said first pole of the second rectifier means being connected in a circuit to the output port of the hybrid,

(h) first and second signal storage means having attack times which are significantly shorter than the decay times, for storing individual signals carried by said second poles of the first and second rectifier means respectively,



(i) a differential amplifier having separate inputs connected to corresponding ones of the signal storage means, for receiving individual signals at its separate inputs,

(j) means for driving gain control inputs of the first and second variable gain amplifiers in opposite gain directions connected between the output of the differential amplifier and the gain control inputs of the first and second variable gain amplifiers, and

(k) means for applying an offset to the first variable gain amplifier gain control input whereby a voice transmission path is provided from the microphone to the hybrid in the absence of signal received from the telephone line.

4,527,015

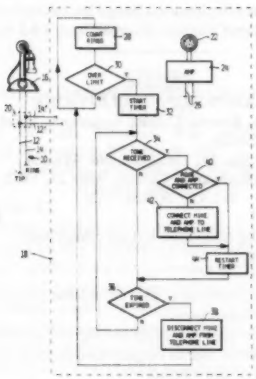
SECURITY LISTENING SYSTEM

Colin T. Chambers, 1528 Myra Ave., Los Angeles, Calif. 90027, and James V. Rhodes, P.O. Box 447, Tempe, Ariz. 85281

Filed Dec. 5, 1983, Ser. No. 558,316

Int. Cl.[3] **H04M** *11/00*

U.S. Cl. 179—84 R **4 Claims**



1. A security listening system activated by and transmitting over telephone lines, comprising:

connecting means for electrically connecting to the telephone line;

first sensing means operably connected to said connecting means for sensing ring signals on the telephone line;

timer means operably connected to said first sensing means for providing a controlled time period after said sensing means senses a pre-established number of rings in a ring sequence;

second sensing means operably connected to said timer means and said connecting means for sensing the presence on the telephone line of a pre-established tone during said controlled time;

a microphone for detecting sound;

an amplifier operably connected to said microphone for producing sound detected by said microphone amplified at an output thereof;

switch means operably connected to said connecting means, said second sensing means, and said output of said amplifier for connecting said output of said amplifier to the telephone line when said pre-established tone is sensed during the duration of said controlled time period; and

restart means operably connected to said second sensing means, said switch means, and said timer means for restarting said timer upon the receipt of subsequent ones of said pre-established tone when said amplifier is connected to the telephone line whereby said controlled time period can be extended.

4,527,016

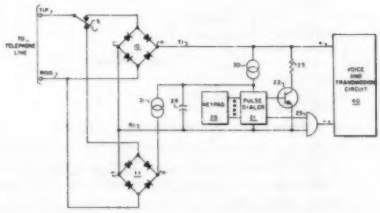
CURRENT REGULATED PULSE DIALER WITH MEMORY RETENTION CIRCUIT

John D. Sublette, Huntsville, Ala., assignor to GTE Business Communication Systems Inc., Northlake, Ill.

Filed Aug. 25, 1983, Ser. No. 526,258

Int. Cl.[3] **H04M** *1/274, 1/31*

U.S. Cl. 179—90 B **8 Claims**

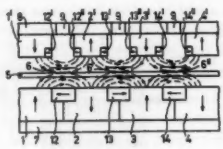


1. A telephone circuit connected to a telephone line, comprising: pulse dialing means; first current regulating means including a first rectifying bridge and a first current regulator connected between said first rectifying bridge and said pulse dialing means; second current regulating means including a second rectifying bridge and a second current regulator connected between said second rectifying bridge and said pulse dialing means and hookswitch means normally in the "ON HOOK" position connecting said telephone line to said second current regulating means, operated to the "OFF HOOK" position to connect said telephone line to said first current regulating means, and said hookswitch means restored to said "ON HOOK" position to disconnect said first current regulating means from said telephone line and reconnect said second current regulating means to said telephone line.

4,527,017
MAGNET SYSTEM FOR AN ELECTROACOUSTIC TRANSDUCER

Wiert Kopinga, and Herbert Mimmel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,668
Claims priority, application Netherlands, Nov. 20, 1979, 7908447
Int. Cl.³ H04R 9/02
U.S. Cl. 179—115.5 PV 10 Claims

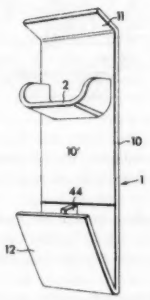


9. An electroacoustic transducer comprising a vibratile diaphragm having a plurality of parallel conductors on at least one surface thereof, a magnet system positioned to one side of the diaphragm and comprising a plurality of adjacent permanent magnetic zones having substantially opposed directions of magnetization perpendicular to the plane of the diaphragm so that an energizing magnetic field is produced at the conductors which extends substantially parallel to the diaphragm surface and transverse to the longitudinal axes of the conductors, and magnetizing means for producing auxiliary magnetic fields at boundary areas between said adjacent permanent magnetic zones in a direction approximately parallel to the opposite to the energizing magnetic field at the nearest conductor on the diaphragm.

4,527,018
SUPPORT FOR A ONE-PIECE TELEPHONE

Giovanni Offredi, Milan, Italy, assignor to Gnecchi and Company S.p.A., Milan, Italy

Filed Jun. 10, 1982, Ser. No. 386,920
Claims priority, application Italy, Jun. 17, 1981, 60930/81[U]
Int. Cl.³ H04M 1/04
U.S. Cl. 179—146 R 10 Claims



1. A support for a one-piece telephone having a switch hook intermediate the ends of a face surface, said support comprising:

a base plate of generally rectangular form having means for receiving and supporting a part of the face surface of said one-piece telephone;

wherein said base plate is of a one-piece construction having a planar main body portion, a planar first end portion and a planar second end portion;

wherein said planar first end portion of said base plate extends upwardly from a lower end of said planar main body portion at an acute angle with respect to said main body portion, said upwardly extending portion being positioned to engage the switch hook intermediate the ends of the face surface when the telephone is placed in a predetermined orientation on said support, whereby said upwardly extending portion automatically switches off said telephone;

wherein said planar second end portion of said base plate extends upwardly from an upper end of said planar main body portion at an obtuse angle with respect to said main body portion;

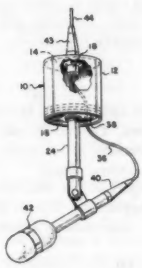
wherein said means for receiving and supporting said one-piece telephone comprises said second end portion and a tapered, generally saddle-shaped projection extending from said front face of said main body portion, said saddle-shaped projection having a concave shape such as to closely fit the cooperating surfaces of the telephone in the manner of a mechanical hook; and

wherein said upwardly extending lower portion is remote from said saddle-shaped projection thereby defining an open area which permits access to said front face of said main body portion.

4,527,019
MICROPHONE HANGER

William M. Lemp, 117 Wolf Ave., Englewood, Ohio 45322

Filed Jun. 20, 1984, Ser. No. 622,617
Int. Cl.³ H04R 1/00, 1/20
U.S. Cl. 179—146 R 9 Claims



1. A directional microphone hanger comprising:

a base member,

said base member having a top wall attached thereto,

an audio jack attached to said top wall,

a bottom wall disposed beneath said top wall and slidably mounted on said base member for rotation with respect thereto through 360°,

a microphone mount attached to and projecting downwardly from said bottom wall,

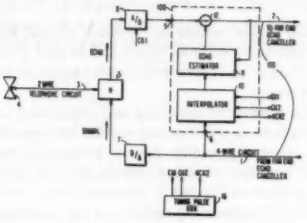
a directional microphone mounted on said microphone mount and disposed entirely beneath said base member and said bottom wall thereof, and

cable means interconnecting said audio jack and said directional microphone.

4,527,020
ECHO CANCELLER FOR A LONG-DISTANCE TELEPHONE NETWORK

Yoshinori Ito, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1981, Ser. No. 304,497
Claims priority, application Japan, Sep. 26, 1980, 55-134009
Int. Cl.³ H04B *3/20*
U.S. Cl. 179—170.2 **15 Claims**



1. An echo canceller for use in a long-distance telephone network having a four-wire circuit and a two-wire circuit, and which is responsive to an incoming digital signal supplied from a reception-side path of said four-wire circuit and to an outgoing digital signal including a digital echo signal and a two-wire digital signal, said digital echo signal being inherently produced at the junction of the four-wire circuit and the two-wire circuit, said incoming and outgoing digital signals having different sampling rates, wherein said echo canceller comprises:

a sample interpolator responsive to at least first and second samples of said incoming digital signal for converting said incoming digital signal into a digital signal having the same sampling rate as that of the outgoing digital signal and assuming a value based on the relative positions of the sampling times of the incoming and outgoing digital signals;

an echo estimator responsive to an output of said sample interpolator for producing an estimated echo signal to cancel said echo signal; and

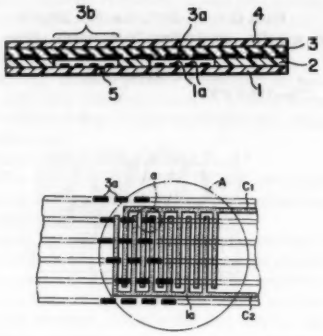
means for subtracting the estimated echo signal from the outgoing digital signal to produce an echo-cancelled digital signal, said echo estimator also being responsive to an output of said subtracting means.

4,527,021
KEYBOARD SWITCH ASSEMBLY

Yoshitsugu Morikawa, Tokyo; Kiyoshi Nomoto, and Kenichi Okada, both of Saitama, all of Japan, assignors to Shin-Etsu Polmer Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 397,065, Jul. 12, 1982, abandoned. This application Feb. 3, 1984, Ser. No. 576,872
Claims priority, application Japan, Jul. 15, 1981, 56-104987[U]
Int. Cl.³ H01H *13/70*
U.S. Cl. 200—5 A **7 Claims**

1. A key-board switching unit which comprises (a) a printed circuit board provided with a plural number of pairs of fixed contact points on a first surface thereof, and (b) an insulating covering sheet member having a bottom surface provided with a multiplicity of electroconductive members formed of a pressure-sensitive electroconductive rubber forming movable contact points, said bottom surface arranged facing said first surface, the size of each of the electroconductive members being sufficiently small in comparison with the dimensions of the fixed contact points, the electroconductive members forming the movable contact points are distributed over the whole bottom surface and are supported relative to the printed circuit board so that a switch is formed with each pair of the fixed contact points on the printed circuit board and at least one movable contact point with the density of distribution of the electroconductive members forming the movable contact points being sufficiently large to ensure that at least one electroconductive member is contacted with the fixed contact

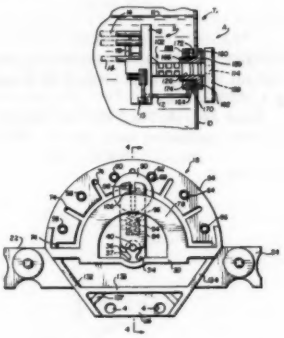


points to bridge therebetween when the covering sheet member is pressed toward the printed circuit board due to the pressure sensitive electroconductive material forming the electroconductive members.

4,527,022
TAP CHANGER

Frank B. Vazquez, 217 E. Enid Dr., Key Biscayne, Fla. 33149

Filed Apr. 10, 1984, Ser. No. 597,371
Int. Cl.³ H01H *19/56*
U.S. Cl. 200—8 R **29 Claims**



1. A tap changer adapted for being mounted to and operatively engaged with an electrical transformer or the like, comprising:

(a) a frame including means for mounting said frame to a transformer, said frame further including a generally planar portion and a flange portion generally transverse thereto;

(b) a plurality of spaced axially parallel contacts extending from said planar portion for engaging associated contacts of a transformer;

(c) a generally planar support extending from said flange portion parallel to and spaced from said planar portion;

(d) pivot control means extending from said flange portion for defining a pivot axis parallel to and generally equidistant from said contact axes;

(e) shaft means including means cooperatively engaging said

pivot control means adapted for permitting rotation of said shaft means on said pivot axis;

(f) brace means extending from said shaft means generally transverse to said pivot axis and adapted for bearing against said planar support for positioning said shaft means in association with said pivot control means;

(g) displaceable disk means associated with said brace means and adapted for simultaneously engaging an adjacent two of said contacts whereby rotation of said shaft means causes said disk means to engage at least another one of said contacts while also disengaging from at least one of the two contacts; and,

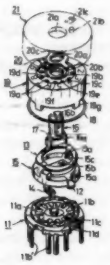
(h) resilient means associated with said brace means engaged with said disk means for maintaining said disk means in engagement with the two contacts and for maintaining engagement of said shaft means engaging means with said pivot control means.

4,527,023

SMALL-SIZED ROTARY SWITCH

Shigeo Ohashi, and Yoshiharu Kawashima, both of Tokyo, Japan, assignors to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1983, Ser. No. 567,381
Claims priority, application Japan, Jan. 16, 1983, 58-4026[U]
Int. Cl.³ H01H *21/76*
U.S. Cl. 200—11 G **9 Claims**



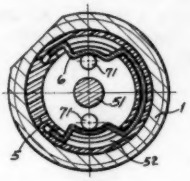
1. A small-sized rotary switch which comprises a base plate, fixed contacts provided about a peripheral edge of said base plate, a movable contact slidable on said fixed contacts which can selectively engage one of said fixed contacts, a common contact provided on a center portion of said base plate to be engaged by a portion of said movable contact, a converter slidably disposed on said base plate and comprising said movable contact, a rotary shaft rigidly connected to said converter for rotating said converter, a cap having a center aperture which passes through a upper portion adapted to fit onto said base plate about said rotary shaft passing through said center aperture so as to accommodate and provide a seal for said fixed contacts, said movable contact, said common contact and said converter, a stopper plate connected to said rotary shaft for rotation with said rotary shaft, slidably disposed on said cap, said stopper plate being provided with an ear piece, and a variable stopper made to fit over and compliment said cap so as to selectively fit onto said cap such that a number of said fixed contacts engaged with said movable contact can be selected, said stopper plate intervening between said variable stopper and said cap, with either one of said cap and said variable stopper being provided with an engagement member to engage said ear piece of said stopper plate.

4,527,024

STRUCTURE OF LOCK FOR ELECTRIC SUPPLYING SWITCH

Juh M. Lai, 4th-10, 765, Wen Lin Rd., Taipei City, Taiwan

Filed Mar. 19, 1984, Ser. No. 591,321
Int. Cl.³ H01H *21/64, 27/06*
U.S. Cl. 200—11 C **8 Claims**



1. An electric supplying switch lock comprising:

a lock case having a cylindrical surface with an outer wall and an inner wall and a front end and a back end, said front end having two guide grooves therein, said inner wall having at least two circumferentially disposed steps and a plurality of axially disposed locked key grooves extending from the second step toward the back end of said lock case, and a circumferential arc groove extending between said guide grooves, and a circumferential ring groove at a back end of said locked key grooves, said lock case having a fixing hole extending radially through said outer and inner walls for holding a fixing pin which extends inside of said inner wall;

a lock core disposed inside of said lock case and capable of axial and rotational movement and having a cylindrical shape with a front end and a back end, said cylindrical shape having a front section, a middle section, and a rear section wherein said middle section has a larger outside diameter than said front and said back sections, said middle section having two lock bolt holes, each disposed radially and holding a small spring and a lock bolt so that said lock bolt extends radially beyond the surface of said middle section so as to slide within said locked key grooves and said ring groove, and an angular arc groove disposed circumferentially on the outer surface of said middle section so as to describe an arc of less than 180° for engaging said fixing pin so as to limit the axial and angular movement of said lock core within said lock case, said front section having a plurality of lock pins disposed on the outer surface of said front section and extending axially from said middle section toward said front end of said lock core;

a rotary seat disposed inside of said lock case and engageable with said back end of said lock core and having a cylindri-

cal surface with an outer wall and an inner wall, and a fixing groove wall disposed inside of said rotary seat inner wall and extending more than 180°, said fixing groove wall having two cracks therein disposed 180° apart;

a spring disposed between said lock core and said rotary seat so that the axial movement of said lock core causes the lock core to engage said rotary seat whereby the rotary seat may be rotated with said lock core;

a conducting sheet disposed between said fixing groove wall and said rotary seat inner wall, having two extensions which are pulse shaped and positioned to extend through said fixing groove cracks to act as two contact points;

and

a terminal seat rigidly attached to said lock case back end and having two terminal rods extending through said terminal seat so as to come into contact with said pulse shaped extensions of said conducting sheet for providing an electrical switch which can be operated by the rotary motion of said lock core and said conducting sheet within said lock case so that said electric supplying switch lock can only be operated with the use of a correct key.

4,527,025

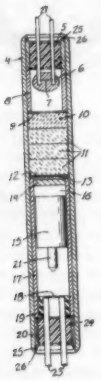
MINIATURE DELAY SWITCH

Mihai D. Patrichi, Los Angeles, and Delbert L. Evanson, Mission Hills, both of Calif., assignors to Networks Electronic Corp., Chatsworth, Calif.

Filed Feb. 2, 1983, Ser. No. 478,977

Int. Cl.³ H01H *39/00*

U.S. Cl. 200—61.08 **5 Claims**



1. A miniature delay switch comprising a tubular housing; a leader comprising a block of insulating material fixed in one end of said housing; a pair of priming rods extending through and fixed in said header; a bridge wire extending between said fixed to inner end portions of said priming rods; a priming charge enclosing said bridge wire; an ignition charge adjacent said priming charge, adapted to be ignited by burning thereof; a delay charge adjacent said ignition charge, in position to be ignited by burning thereof and to burn throughout a delay period; a base charge adjacent the last to burn portion of said delay charge, said base charge being adapted to explode from ignition by said delay charge; a pair of terminal rods fixed in the other end of said housing; and a plunger slidable in said housing toward said terminal rods and adapted to advance toward the same under expansion of gas created by explosion of said base charge, and plunger having a nose pin adapted to enter between the inner ends of said terminal rods.

4,527,026

DEVICE FOR MOVING AN ELEMENT BETWEEN TWO END POSITIONS BY MEANS OF AN ENERGY BUFFER

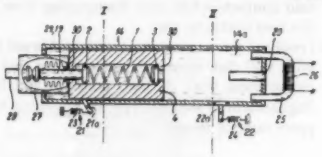
Peter V. Has, Haaksbergen, and Arend J. W. Lammers, Hengelo, both of Netherlands, assignors to Hazemeijer B.V., Hengelo, Netherlands

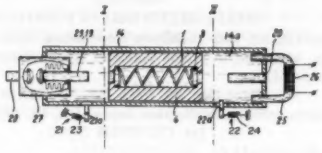
Filed Oct. 24, 1983, Ser. No. 544,647

Claims priority, application Netherlands, Oct. 25, 1982, 8204110

Int. Cl.³ H01H *3/22, 5/06*

U.S. Cl. 200—78 **6 Claims**





1. A device for operating a movable actuation rod of a switch, said device comprising

a housing having opposite first and second housing ends, said first housing end being capable of mounting thereon a switch having said movable switch actuation rod extending at least partly into said housing, said housing including stop means at the second housing end,

a mass movably positioned in said housing, said mass having opposite first and second mass ends,

an actuation element at the first mass end and capable of driving said switch actuation rod,

a support means at the second mass end and capable of cooperating with said stop means,

means arresting movement of said actuation element and said support means along said mass,

an elastic energy storage means associated with said mass through said actuation element and said support means,

a first locking means for said mass associated with said mass to hold said mass in a first mass end position nearest the first housing end at the moment the kinetic energy of said mass will be zero,

a second locking means for said mass associated with said mass to hold said mass in a second mass end position nearest the second housing end at the moment the kinetic energy of said mass will be zero,

an energy supply means associated with said housing,

said mass being movable within said housing between said first mass end position nearest the first housing end and said second mass end position nearest the second housing end, thus transforming potential energy into kinetic energy and vice versa; and when a switch with movable switch actuation rod is mounted at the first housing end, such that its actuation rod extends into said housing, said device will operate as follows:

(1) just before said mass will be locked in said first mass end position by said first locking means and after said switch actuation rod has pushed said actuation element to an end position nearest the second mass end, thereby concurrently moving said switch actuation rod inwardly of said

switch to an end position defined by the closed state of said switch, said mass will convert its remaining kinetic energy into potential energy while further moving into the first housing end position, thereby compressing said energy storage means and increasing its stored potential energy,

(2) when said first locking means releases said mass, said energy storage means will expand, causing said mass to move toward the second housing end, its storage potential energy being converted to kinetic energy, said switch actuation rod at the same time being allowed to move outwardly of said switch,

(3) just before said mass will be locked in said second mass end position by said second locking means and after said stop means has pushed said support means towards said actuation element and caused said support means to take up an end position farthest from the second mass end, said mass will convert its remaining kinetic energy into potential energy while further moving to its second mass end position, thereby compressing said energy storage means and increasing its stored potential energy, and

(4) said energy supply means adding energy to said energy storage means when said mass is in its second end position to maintain the potential energy stored therein at a constant value, whereby said mass is moved from said second end position to said first end position substantially solely by the stored potential energy of said elastic energy storage means.

4,527,027

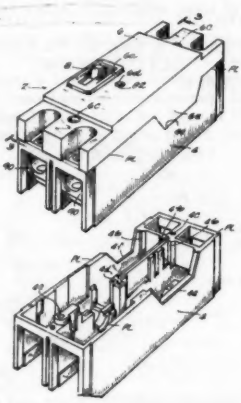
MOLDED CASE CIRCUIT BREAKER WITH IMPROVED HIGH FAULT CURRENT INTERRUPTION CAPABILITY

Donald A. Link, Hubertus; John A. Swessel, Jr., Milwaukee, and Peter J. Theisen, West Bend, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 399,086, Jul. 16, 1982, Pat. No. 4,470,027. This application Apr. 20, 1984, Ser. No. 602,293

Int. Cl.³ H01H *33/02, 9/02*

U.S. Cl. 200—144 R **5 Claims**



1. A circuit breaker comprising, in combination:

a molded insulating base having a bottom wall and upstanding sidewalls;

separable contacts disposed in said base;

arc extinguishing means disposed in said base in proximity to said separable contacts;

operating means for operating said separable contacts between open and closed positions;

a molded insulating cover having a top wall and depending sidewalls, said cover being mounted to said base wherein the outer ends of the respective upstanding and depending sidewalls are in mutual engagement along a substantially planar parting line located nearer said top wall than said bottom wall;

said base sidewalls being recessed adjacent said arc extinguishing means and said separable contacts for relocating a portion of said parting line within said recess nearer said bottom wall; and

said sidewalls of said cover having depending extensions formed complementally to said recesses for mutually engaging said base sidewalls within said recesses along said relocated parting line.

4,527,028

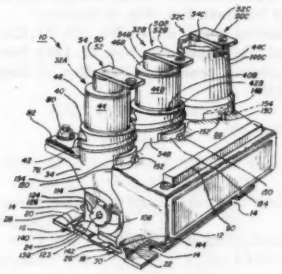
MODULAR VACUUM INTERRUPTER

Elmer L. Luehring, Cleveland Heights, Ohio, assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Jun. 27, 1984, Ser. No. 625,047

Int. Cl.³ H01H *33/66*

U.S. Cl. 200—144 B **20 Claims**



1. A modular vacuum interrupter for controlling the application of electrical power to electrical apparatus comprising

a base,

a vacuum switch module having an insulating housing and a vacuum switch mounted on said housing,

said vacuum switch including a pair of contacts capable of being placed in an OPEN position or in a CLOSED position,

operating means for placing said pair of contacts in said CLOSED position,

an insulating cover for at least a portion of said operating means and

hardwareless means for removably interconnecting said vacuum switch module, said cover and said base to form a modular vacuum interrupter.

4,527,029

ENCAPSULATED, COMPRESSED GAS INSULATED HIGH VOLTAGE SWITCHGEAR

Sigismund Brockmann, and Ingo Gottschalk, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 7, 1984, Ser. No. 618,020

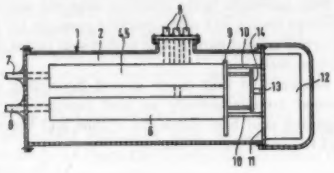
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321836

Int. Cl.³ H01H *33/54*

U.S. Cl. 200—148 B **4 Claims**

1. In an encapsulated, compressed gas-insulated high-voltage switchgear, having drive-actuated breaker units disposed in the interior of the encapsulation and supported by a flange plate which closes the encapsulation so it is pressureproof and which is connected with the drive on a side away from the interior,

the improvement wherein an essentially flat support plate which directly receives the breaker units, and which, extend-



ing parallel with the flange plate, is connected therewith via at least three parallel spacers arranged in a triangle.

4,527,030

KEYBOARD

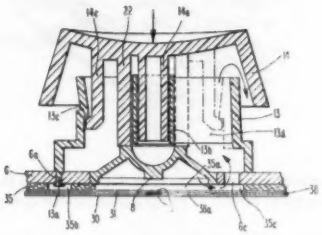
Jürgen Oelsch, Salz, Fed. Rep. of Germany, assignor to Preh Elektrofeinmechanische Werke, Jakob Preh Nachf., GmbH & Co., Bad Neustadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 315,751, Oct. 28, 1981, abandoned. This application Nov. 22, 1983, Ser. No. 555,034

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041859

Int. Cl.³ H01H *13/04*

U.S. Cl. 200—306 **6 Claims**



1. A keyboard assembly comprising a number of movable keys, each of said keys being movably retained in juxtaposition to unitary molded snap-action elements sealed to a metallic support member and to a pair of conductors mounted on flexible substrates in close juxtaposition to one another and aligned with said snap-action elements, such that upon depression of one of said keys, the corresponding snap-action element urges one of the corresponding pair of conductors into contact with the other, said assembly comprising a spacer sheet interposed between said flexible substrates and having holes punched therethrough to permit one of said pair of conductors to contact the other, wherein a hole is formed in said metallic support member in the region under each of said keys, the periphery of each of said keys being open to the atmosphere, whereby air is not confined under said unitary snap-action elements sealed to said metallic plate.

4,527,031

ELECTROMECHANICAL SYSTEM FOR GENERATING HEAT IN METALLIC VESSELS

Luis R. Aparicio, Gran Via, 57, Madrid-13, Spain

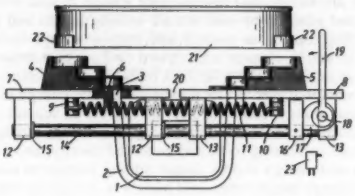
Filed Jun. 13, 1984, Ser. No. 620,065

Int. Cl.³ H05B *6/12*

U.S. Cl. 219—10.49 R **11 Claims**

1. An electromechanical system for generating heat in metallic vessels, comprising:

an electrically conductive vessel which acts as a load resistance for the secondary of a transformer, a transformer having a secondary providing a low voltage and a high current related to match the ohmic value of said vessel in response to the power that is to be dissipated in said vessel as heat, said vessel having contact members on opposite sides for receiving the voltage developed in the secondary of said transformer and applied to the vessel, conductive electrodes connected to said transformer secondary adapted to directly engage said contact members on said vessel, pressure means acting on said electrodes normally biasing said electrodes to approach each other to establish pressure contact with said contact members of said vessel when said vessel is placed in an operative position between said elec-



trodes for heating, mechanical means for controlling the action of said pressure means allowing pressure therefrom to be exerted or neutralized, and when neutralized providing separation of said electrodes for allowing said vessel in which heat is to be generated to be removed from or placed between said electrodes, and circuit means for closing an electric circuit for energizing said transformer to generate said secondary current for passage through said vessel after placement in said operative position clamped between said electrodes.

4,527,032

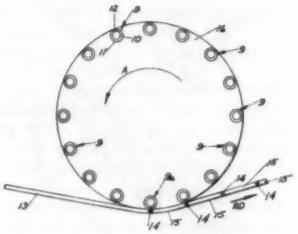
RADIO FREQUENCY INDUCTION HEATING DEVICE

Russel L. Young, Collinsville, and David E. Margerum, Middletown, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Nov. 8, 1982, Ser. No. 439,777

Int. Cl.³ H05B *6/40*

U.S. Cl. 219—10.61 R **9 Claims**



1. A radio frequency induction heater and a metallic strip which is moved in its rolling direction, said induction heater comprising an electrical conductor, an elongated core of magnetic material surrounding said conductor, a narrow slot in said core of a width of from about 0.003 to about 0.1 inch, said slot extending longitudinally of said core, comprising an inductor core air gap and forming substantially opposed pole faces in said core, a source of radio frequency current in the range of from about 10 kHz to about 27 MHz, said conductor being connectable across said source of radio frequency current, said heater being located transversely of said metallic strip with said metallic strip located adjacent and preferably in contact with said core at said gap therein, whereby narrow bands of said strip in parallel spaced relationship are heated when eddy

currents are periodically induced therein by said radio frequency current.

4,527,033

STEEL PIPE WELDING METHOD

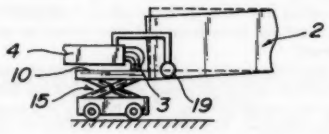
Junya Matsuyama, Yotsukaido; Akio Kamada, Chiba; Fumimaru Kawabata, Chiba; Tatsufumi Uegaki, Chiba, and Shigeru Miyake, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed May 23, 1983, Ser. No. 496,840

Claims priority, application Japan, May 21, 1982, 57-86110

Int. Cl.³ B23K *9/02*

U.S. Cl. 219—61 **17 Claims**



1. A longitudinally welded steel pipe welding method for welding an inner seam by welding electrodes held by a boom which is supported by a preceding tracing roller moving along an inner groove of a steel pipe, comprising steps of urging at least one metal plate against at least one end of the steel pipe at said groove after tack welding said seam on an outside of the steel pipe on an opposite side of said inner groove at least at the end of the steel pipe, and preventing lateral angular deformations or changing of the lateral angular deformations of the end of the steel pipe on both sides of a weld bead due to a load of said boom when said preceding tracing roller leaves said end of the steel pipe for said metal plate.

4,527,034

ELECTRODE POSITIONING METHOD AND APPARATUS FOR NC-EDM

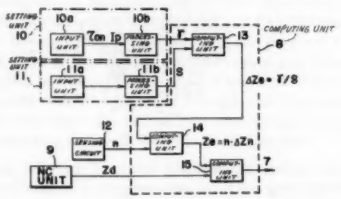
Kiyoshi Inoue, Tokyo, and Akihiko Shimizu, Kawasaki, both of Japan, assignors to Inoue-Japax Research Incorporated, Yokohama and Japax Incorporated, Kawasaki, both of, Japan

Filed Jan. 27, 1983, Ser. No. 461,555

Claims priority, application Japan, Feb. 3, 1982, 57-16836

Int. Cl.³ B23P *1/08, 1/14*

U.S. Cl. 219—69 G **6 Claims**



1. An NC-EDM method of machining a conductive workpiece by means of a tool electrode undergoing erosive wear across a machining gap, comprising the steps of:

advancing EDM stock removal in the workpiece by developing a succession of effective electrical discharges across the gap while relatively displacing the tool electrode and the workpiece under a sequence of numerical commands furnished from a numerical control (NC) unit; and

correcting the numerically commanded relative displacement so as to compensate for the electrode wear during said EDM stock removal by:

producing a first signal representing a prescribed amount (γ) of the electrode wear per single effective electrical discharge for said EDM stock removal,

counting the effective electrical discharges during said EDM stock removal to produce a second signal representing the counted number (n) of the effective electrical discharges,

producing a third signal representing an effective machining area (S) of the tool electrode during said EDM stock removal, and

during said EDM stock removal, processing said first, second and third signals in a data-processing unit to compute, according to an equation: $Ze=n\cdot\gamma/S$, a corrective amount (Ze) of relative displacement represented by a signal and modifying said numerical commands with said corrective signal to add said computed amount to an amount (Zd) of said numerically commanded displacement effected between the tool electrode and the workpiece.

4,527,035

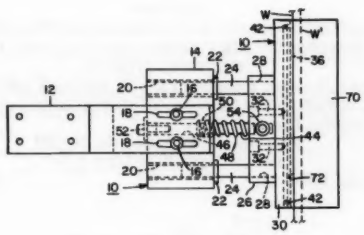
WIRE ELECTRICAL DISCHARGE MACHINE FLUSHING PROCESS AND APPARATUS

Peter J. Majestic, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 288,390, Jul. 30, 1981, abandoned. This application Oct. 17, 1983, Ser. No. 542,544

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W **8 Claims**



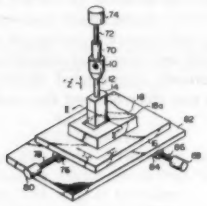
1. A method of forming a slot in a workpiece utilizing a wire cutting electrical discharge machining process which comprises, providing a workpiece having an exterior surface to be cut along its entire extent, positioning an electrical discharge machining wire have an axis adjacent the extent of said exterior surface to be cut with the axis of the wire parallel to the extent of said exterior surface, providing a substantially enclosed longitudinal path about said cutting wire externally of and along the extent of said exterior surface to be cut with said path being open at end portions adjacent terminating edges of said surface by positioning a trough member having a channel formed in a forward surface in operable engagement with the exterior surface of said workpiece to be cut such that said electrical discharge machining wire is positioned within the channel formed in said trough said wire axis extending along said channel to run along the extent of the exterior surface, applying fluid to said path and directing such fluid longitudinally along said substantially enclosed longitudinal path about said cutting wire, and flushing out eroded particles formed during the cutting of a slot in the surface of the workpiece.

4,527,036

METHOD FOR PATTERN CONTROLLED ELECTRODE MOVEMENT FOR E.D.M.

Toshihiko Furukawa, 10-15, Tsukimino 1-chome, Yamato-shi, Kanagawa 242, Japan

Continuation of Ser. No. 178,235, Aug. 14, 1980, Pat. No. 4,367,391. This application Dec. 27, 1982, Ser. No. 452,975
The portion of the term of this patent subsequent to Jan. 4, 2000, has been disclaimed.
Int. Cl.[3] B23P *1/00*
U.S. Cl. 219—69 M 3 Claims



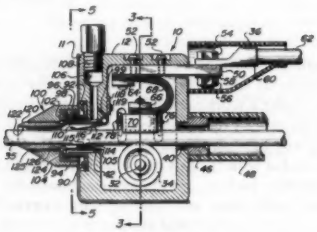
1. An electro-discharge machining method for progressively conducting precise machining through relative straight and arcuate approach movements between an electro-discharge machining electrode and a workpiece in the horizontal direction substantially perpendicular to a direction in which said electrode is opposed to said workpiece, which method is characterized by dividing a movement region of said relative approach movements into a plurality of straight and arcuate sections within the horizontal plane and designating trajectories of said relative straight and arcuate approach movements for the respective straight and arcuate sections for successively and progressively achieving the machining.

4,527,037

ELECTRODE DRIVE AND NOZZLE SYSTEM FOR AN AUTOMATIC AIR CARBON-ARC CUTTING AND GOUGING TORCH

David E. Johnson, Pataskala; Larry A. Aebersold, and Kenneth E. McCall, both of Lancaster, all of Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Apr. 21, 1983, Ser. No. 487,351
Int. Cl.[3] B23K *9/16*; B23P *1/06*
U.S. Cl. 219—69 R 9 Claims



1. In an automatic air carbon-arc cutting and gouging torch of the type adapted for positioning at a fixed position relative to a workpiece and having a means for supporting a consumable electrode juxtaposed to a workpiece, means for directing air along said electrode and means for continuously feeding successive jointed lengths of electrode to said workpiece as said electrode is consumed, the improvement comprising:

a housing fabricated from an electrically insulating structural material having an inlet aperture and an outlet aperture aligned therewith to permit electrode movement through said housing;

means mounted on said housing to cause rotation of a drive wheel adapted to frictionally engage said electrode and move said electrode through said housing;

an idler wheel assembly juxtaposed to said drive wheel and positioned by a clamping lever said lever having means to bias said idler wheel assembly toward said electrode to exert a heavy clamping force to maintain rolling function between said idler wheel and said electrode;

an electrical contact shoe mounted juxtaposed to said drive wheel, said contact shoe separately biased to said drive wheel whereby said biasing maintains said shoe in contact with said electrode with less force than said idler wheel biasing means to reduce sliding friction between said contact shoe and said electrode and adapted to be moved toward and away from said drive wheel by said clamping lever;

an electrode support positioned to support said electrode between said drive wheel and a nozzle assembly mounted in said outlet aperture of said housing said support including means to reposition said electrode to said support when said electrode is temporarily moved out of position on said support during operation of said torch; and

a nozzle assembly including means to direct air in a semi-circular cross-sectional pattern along said electrode toward said workpiece;

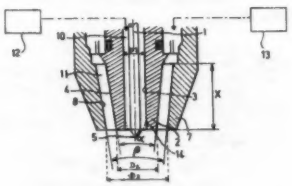
whereby if said electrode is driven into said workpiece said electrode can pivot on said drive wheel and move out of said support to thus prevent breaking of said electrode inside said housing.

4,527,038

WELDING TORCH WITH NON-CONSUMABLE ELECTRODE AND DOUBLE SHIELDING GAS FLOW AND THE RELEVANT WELDING PROCESS

Francis Cuny, Mezy-sur-Seine, and Louis Auzary, Paris, both of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Continuation-in-part of Ser. No. 433,242, Oct. 7, 1982, abandoned. This application Feb. 11, 1983, Ser. No. 465,774
Claims priority, application France, Oct. 14, 1981, 81 19295
Int. Cl.[3] B23K *9/16*
U.S. Cl. 219—75 14 Claims



1. An electric arc welding torch of the type providing a double shielding gas flow, and comprising an axially positioned non-consumable electrode, a sleeve coaxial with said electrode and having an outer wall and an inner wall defining, with the electrode, a first annular passage having a width, measured along a radius, of between 0.5 and 1.5 mm, and a torch nozzle coaxially disposed over said sleeve and having an inner wall defining, with the outer wall of the sleeve, a second annular passage concentric with the first annular passage; wherein the second annular passage is of a generally tapered shape with the outer wall of the sleeve converging at an apex angle of convergence α towards a tip of the electrode and with the inner wall of the nozzle converging at an apex angle of convergence β; and wherein the values of said angles of convergence α and β are selected to satisfy a relation defined by a system of rectangular coordinates whose abscissa represents the values of the

angle α and whose ordinate represents the values of the angle β, with these values being inscribed within a quadrangle defined by its apices S'_1, S'_2, S'_3, and S'_4 as follows:

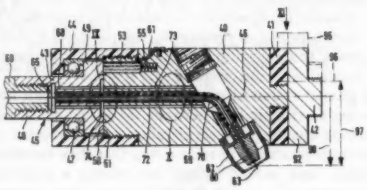
S'_1:
$\alpha = 17.5$ degrees
$\beta = 27.5$ degrees;
S'_2:
$\alpha = 7.5$ degrees
$\beta = 20$ degrees;
S'_3:
$\alpha = 7.5$ degrees
$\beta = 15$ degrees; and
S'_4:
$\alpha = 17.5$ degrees
$\beta = 7.5$ degrees.

4,527,039

METHOD AND APPARATUS FOR INNER LINING METALLIC BEARING LUGS

Peter Füwesi, Zeilweg 7, 6951 Schefflenz-U., Fed. Rep. of Germany

Filed Mar. 4, 1983, Ser. No. 472,038
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208146
Int. Cl.³ B23K *9/04*
U.S. Cl. 219—76.14 **7 Claims**



1. Apparatus for inner lining metallic bearing lugs which are held at a standstill during treatment, comprising an elongated rotary electrically conductive carrier; a welding nozzle mounted on and having an axis which is inclined relative to the axis of said carrier; an axially movable electrically conductive coupling adjacent to the coaxial with said carrier so that said nozzle orbits about the axis of said carrier when the latter rotates and the nozzle simultaneously moves in the axial direction of said carrier as a result of axial movement of said coupling; conduit means for admission of protective gas to said nozzle, said conduit means being connected to said coupling, said carrier having a duct extending from said coupling to said nozzle and at least one channel for conveying gas from said conduit to said nozzle; a protective hose installed in said duct; a welding wire slidably extending through said hose and into said nozzle; and means for electrically connecting said carrier with said coupling and with the wire in said nozzle.

4,527,040

METHOD OF LASER WELDING

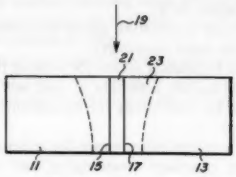
Deug W. Moon, and Edward A. Metzbower, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 16, 1983, Ser. No. 504,994
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LD **15 Claims**

1. A method of welding two structural steel members to produce a weld joint having improved impact toughness comprising the step of:

(a) introducing an inoculant comprising an insert of Inconel 600 in the range of 0.005 inch in thickness between the surfaces of the two steel members to be welded ranging in composition from HY-80 to HY-100 steel;

(b) butting the surfaces to be welded of the two members against the inoculant; and



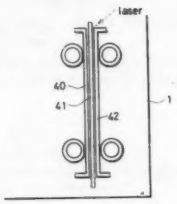
(c) applying a laser beam to the inoculant to weld together the assembly of members and inoculant.

4,527,041

METHOD OF FORMING A WIRING PATTERN ON A WIRING BOARD

Kazuo Kai, 28-1, Kuwazu, 3-chome, Higashi Sumiyoshi-Ku, Osaka, Japan

Filed Jun. 2, 1983, Ser. No. 500,331
Int. Cl.³ B23K *26/00*
U.S. Cl. 219—121 LN **5 Claims**



1. A method for forming a wiring pattern on a wiring board comprising the ordered steps of:

forming an electric conductive pattern on said wiring board between insertion holes in said wiring board for integrated circuits, said conductive pattern having a width substantially equal to a spacing between said holes; and

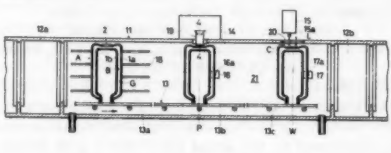
cutting said conductive pattern to form a plurality of fine wiring lines.

4,527,042

METHOD AND APPARATUS FOR VACUUM SEALING A VACUUM CONTAINER ASSEMBLY

Hiroshi Shinohara, Nara, and Kiyoshi Nagai, Hyogo, both of Japan, assignors to Taiyo Sanso Co., Ltd., Osaka, Japan

Filed Jun. 15, 1983, Ser. No. 504,713
Claims priority, application Japan, Jun. 21, 1982, 57-107308
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LC **2 Claims**



1. An apparatus for sealing a vacuum container assembly having an outer container with an evacuation hole and an inner container, comprising:

a vacuum chamber means;

heating means for heating the vacuum container assembly in said vacuum chamber;

sealing plate fitting means for installing a sealing plate within the evacuation hole;

welding energy application means for welding the sealing plate to the outer container;

first position regulating means for sensing the presence of a vacuum container assembly at said sealing plate fitting means and for controlling the movement of said transport means; and

second position regulating means for sensing the position of a vacuum container assembly at said welding energy application means and for controlling the movement of said transport means.

4,527,043

LASER MACHINING SYSTEM

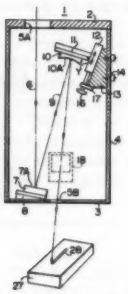
Masayoshi Hashiura; Akiyasu Okazaki, and Sigeru Suzuki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,267

Claims priority, application Japan, Feb. 18, 1983, 58-24638

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LQ **10 Claims**



1. A laser machining system having at least a cylindrical mirror placed aslant for transforming an input laser beam into an output linear beam which is irradiated on to an object for heating, wherein at least a pair of slant-type plane mirrors for reflecting said linear beam are disposed between said cylindrical mirror and said object, at least one of said plane mirrors being provided with means which variably makes the lengthwise dimension of said linear beam at the output of said plane mirror smaller than the lengthwise dimension of said linear beam at the input of said plane mirror.

4,527,044

APPARATUS FOR TREATING A SAMPLE BY A PULSED ELECTRON BEAM

Michel Bruel, Veurey, France; Michel Floccari, deceased, late of Grenoble, France (by Henriette Floccari, administratrix), and Jean-Francois Michaud, Montmelian, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 21, 1982, Ser. No. 370,386

Claims priority, application France, Apr. 28, 1981, 81 08449

Int. Cl.³ B23K *15/00, 9/00*

U.S. Cl. 219—121 EB **1 Claim**

1. An apparatus for the treatment of a sample by a pulsed electron comprising, in a vacuum enclosure, a cathode and an anode constituted by the actual anode and a grid, means for supplying the sample to be treated to the said vacuum enclosure, a high d.c. voltage generator, and

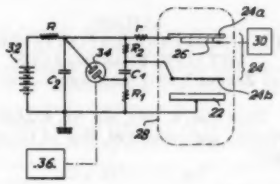
(A) a first circuit for producing a plasma in pulsed manner from the cathode, said first circuit comprising

(a) a capacitor of capacitance C_1 charged by means of the high d.c. voltage generator, said capacitor being provided with first and second coatings,

(b) a spark gap switch enabling the initiation of the discharge of the capacitor of capacitance C_1 so as to produce a high voltage pulse between the cathode and the grid, said spark gap switch being arranged in series with the said capacitor,

(c) means for producing pulses controlling the spark gap switch,

(d) two resistors R_1 and R_2 connected in series with the capacitor of capacitance C_1 in such a way that one of the terminals of resistor R_1 is connected to the first coating of the said capacitor and wherein one of the terminals of resistor R_2 is connected to the second coating of said capacitor, the spark gap switch then being



connected on the one hand to the first coating of the capacitor of capacitance C_1 and on the other hand to the other terminal of resistor R_1, and wherein it also comprises the capacitor or capacitance C_2 connected in parallel with the circuit R_1 C_1 R_2; and

(B) a second circuit separate from said first circuit for producing an electric field between the actual anode and the cathode enabling the acceleration and extraction of the electrons produced in such a way that they bombard the sample, said second circuit comprising a capacitor of capacitance C_2, which is much higher than capacitance C_1, capacitor C_2 being charged by a d.c. voltage generator and which can be discharged by the vacuum enclosure, so as to produce the electric field between the anode and the cathode.

4,527,045

CONTROL APPARATUS FOR AN ARC WELDER

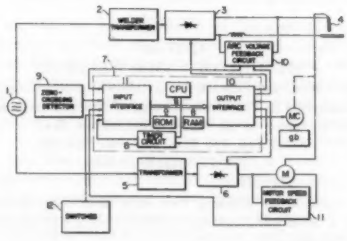
Jun Nakajima, Chiba; Takeshi Araya, Ibaraki; Tadashi Aso, Kanagawa; Kiyoshi Kawamata, Ebina, and Kinji Sugimoto, Yokohama, all of Japan, assignors to Hitachi Seiko Ltd., Tokyo, Japan

Filed Mar. 17, 1981, Ser. No. 244,676

Claims priority, application Japan, Mar. 17, 1980, 55-33630; May 6, 1980, 55-59610; May 16, 1980, 55-65089

Int. Cl.³ B23K *9/10*

U.S. Cl. 219—130.31 **18 Claims**



1. An arc welder comprising welding condition setting means, control circuit means for detecting and feeding back a welder output to control said welder output to a target value of

a condition setting signal determined by said welding condition setting means, storage means for storing at least one proper condition setting signal determined by said welding condition setting means, and stored signal retrieving means for reading out the stored signal in said storage means to set the read-out stored signal as the target value in place of the condition setting signal determined by said welding condition setting means, wherein said arc welder is an automatic arc welder having a function of automatically feeding a condumable wire electrode, and said welding condition setting means produces a wire feed rate signal and a welding voltage signal as said conditon setting signal, and said storage means prestores data of allowable combinations of wire feed rate setting signals and output voltage setting signals which meet proper welding conditions, and further comprising means for comparing and checking if the wire feed rate setting signal and the welding voltage setting signal determined by said welding condition setting means meet a data condition of said proper welding condition setting signals stored in said storage means and for producing an output signal when said data condition is met, and display means being controlled by said output signal to display that the proper conditions are being set.

4,527,046

METHOD AND ARRANGEMENT FOR UNDERWATER ARC WELDING

Osmo Asonen, Peräläntie 22, 11120 Riihimäki, Finland

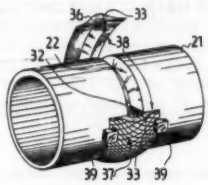
PCT No. PCT/FI83/00035, § 371 Date Dec. 22, 1983, § 102(e) Date Dec. 22, 1983, PCT Pub. No. WO83/03787, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 26, 1983, Ser. No. 571,872

Claims priority, application Finland, Apr. 26, 1982, 821440

Int. Cl.³ B23K *9/02*

U.S. Cl. 219—137 R **9 Claims**



1. A method for underwater arc welding of joints in metallic workpieces of the type in which a welding electrode is placed at a joint to be welded in a lying position and the electrode is ignited to burn and produce a weld at the joint, wherein the improvement comprises the step of:

covering the electrode with a shield prior to electrode ignition, said shield including a mantle having an inner burning layer made of a readily burnable material, an outer protective layer covering said inner layer and means for fastening said mantle to the workpieces, such that the burning of the electrode causes said inner burning layer to burn, thereby producing combustion gases adjacent to the joint to prevent water from contacting the electrode.

4,527,047

ELECTRICALLY HEATABLE BACKING MEANS FOR MIRRORS

Rudolf Seitz, Nuremberg, Fed. Rep. of Germany, assignor to Flabeg GmbH, Fürth, Fed. Rep. of Germany

Filed Oct. 20, 1983, Ser. No. 543,788

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 8233516[U]

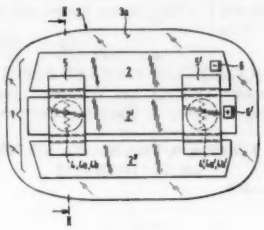
Int. Cl.³ H05B *3/22*

U.S. Cl. 219—219 **2 Claims**

1. Multiple component electrical heating means for mirrors comprising: thin metal sheet means and at least one plate-shaped electrical heating element having two main faces being connected with the said metal sheet means in an electrical current-conducting and heat-conducting manner;

said metal sheet means consisting essentially of at least three metal strips which are spaced from one another and extend parallel with each other,

the aforesaid heating element having a first one of said two main faces in electrical current- and heat-conducting contact with at least a first one of the said metal strips and



said first one of said faces being electrically and heat-insulated from the two strips next adjacent the said first metal strip, and

a metal bridge connecting with one another, in electrical current- and heat-conducting contact, the said two strips next adjacent said first metal strip;

the other main face of the said heating element being in electrical current- and heat-conducting contact with the said metal bridge.

4,527,048

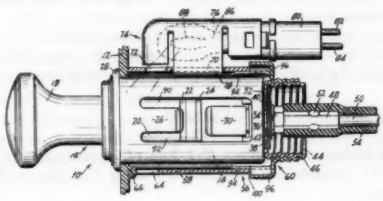
MULTI-PIECE CLAMPING SHELL FOR ELECTRIC CIGAR LIGHTERS

John J. Comerford, Stamford, and Peter J. Lupoli, Hamden, both of Conn., assignors to Sun Chemical Corporation, New York, N.Y.

Filed May 23, 1983, Ser. No. 497,094

Int. Cl.³ F23Q *7/22;* **G12B** *9/00;* **B25G** *3/00;* **F16G** *11/00*

U.S. Cl. 219—269 **26 Claims**



1. A two-piece metal clamping shell for use with threaded sockets of an electric cigar lighter of the type placed in any of a number of different rotative positions in an apertured panel of an automobile or other conveyance, comprising in combination:

(a) a cylindrical body member adapted to encircle such socket, said body member having at one end a keying means for engagement with cooperable keying means at the rear of the apertured panel on which the cigar lighter socket is to be mounted,

(b) said body member having a window in its side wall and having mounting means adjacent the window to support a lamp for directing light therefrom inward through the window to the interior of the body member, and

(c) a clamp ring separate from and rotatable with respect to

said body member, said ring having an internal thread by which it can be screwed onto a threaded end portion of the cigar lighter socket after the latter has been inserted into the panel aperture,

(d) said clamp ring having an outer peripheral nest portion adapted for centered engagement with the other end of the body member while being rotatable with respect thereto, to axially shift and forcibly hold the latter against the rear of the panel when the body member is encircling said socket,

(e) said clamp ring having means engageable by a suitable tool to enable it to be forcibly turned and tightened.

4,527,049

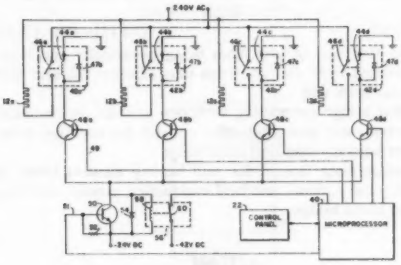
MICROPROCESSOR CONTROLLED ELECTRIC RANGE

Calvin J. Thomas, Orefield, and William J. Day, Allentown, both of Pa., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 9, 1984, Ser. No. 578,723

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—449 **14 Claims**



1. An electric range comprising:

first and second electric heating elements;

a first relay for controlling said first heating element;

a second relay for controlling said second heating element;

means for activating said first relay to energize said first heating element, said first relay activating means comprising a first switch in series with a second switch;

means for activating said second relay to energize said second heating element, said second relay activating means comprising a third switch in series with said second switch; and

means responsive to a short circuit failure in either said first switch or said third switch for preventing said first and second electric heating elements from being energized.

4,527,050

HOTPLATE

Robert Kicherer, Knittlingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Gerate Blanc und Fischer, Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,487

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1981, 3126989

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—464 **16 Claims**

1. A hotplate having a flat hotplate body, with a heatable area having substantially planar top and bottom surfaces, an electrical heating means engaging the bottom surface of the heatable area of the hotplate body and electrical connectors for the heating means, the hotplate comprising:

the hotplate body being formed form a flat substrate of material characterized by good thermal conductivity and electrical insulation even at operating temperatures in excess of approximately 300° C.; and,

a film of an electrically resistive material applied directly to the bottom surface of the heatable area of the hotplate body in a plurality of individual areas which are electrically insulated from one another, the resistive film being unevenly distributed among the individual areas to produce areas having different electric surface loads, whereby an annular outer area of the hotplate may be heated more intensely than the remaining inner area to accommodate typical cooking vessels which tend to engage hotplates in contact zones adjacent their perimeters, the hotplate exhibiting a very low thermal inertia which enables high cooking temperatures to be reached quickly and efficiently.

4,527,051

TOKEN SUCH AS CREDIT OR IDENTIFICATION CARD AND AN APPARATUS FOR TESTING THE TOKEN OR CARD

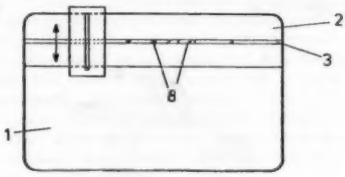
Gerhard Stenzel, Munich, Fed. Rep. of Germany, assignor to Gao Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Sep. 1, 1982, Ser. No. 413,650

Claims priority, application Fed. Rep. of Germany, Jul 6, 1978, 2829778

Int. Cl.³ G06K *5/00*

U.S. Cl. 235—380 **8 Claims**



1. A security document such as a credit or identification card comprising means for modulating passage of energy in waveform through at least a portion of said document; the modulating means being randomly distributed in said portion of said document; said document further comprising means for emitting, transmitting or reflecting wave energy arranged along a line; said wave energy emission, transmissions or reflections being detectable along said line from the card exterior and through the modulating means for providing reproducible signals; said line being of such width and said modulating means random distribution being such that successive detections of energy emissions, transmissions or reflections along the length of said line result in a reproducible, modulated signal which is unique to the line and document with which associated.

4,527,052

AUTOTELLER CARD HANDLING MECHANISM

Hilary M. H. Kilborn, London, England, assignor to Burroughs Corporation, Detroit, Mich.

This application Feb. 2, 1984, Ser. No. 576,501

Claims priority application United Kingdom, Mar. 29, 1983, 8308689

Int. Cl.³ G06K *13/063*

U.S. Cl. 235—485 **24 Claims**

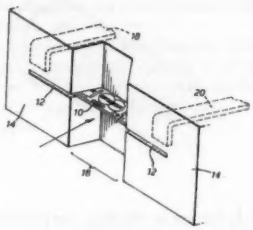
1. A card handling mechanism comprising:

an indented slot in a fascia for the presentation therethrough of a card to a card reader, said indented slot having an indented portion whereby the card remains visible in said

indented portion during said presentation to said card reader;

first and second bale arms having respective first and second angled tips at the respective distal ends thereof; and

actuator means operable to urge said bale arms towards an inserted card for the insertion of said first and second tips respectively on either side of said indented portion behind said fascia, between said slot and the inserted card whereby the withdrawal of the inserted card from said slot is prevented; and



control means coupled to acutate said actuator means upon insertion of a card into said slot, where

said actuator means are subsequently operable to urge said bale arms back from said slot behind said fascia for said tips to engage the inserted card and urge the inserted card against a stop for the inserted card to be positioned in a predetermined position prior to said card reader reading the inserted card.

4,527,053

FOCUS DETECTING DEVICE WITH RELATIVE MOVEMENT DETECTION

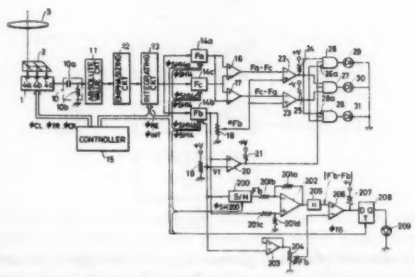
Takao Kinoshita, Tokyo, and Kazuya Hosoe, Kunitachi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1982, Ser. No. 390,023

Claims priority, application Japan, Jun. 30, 1981, 56-102013

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—201 **16 Claims**



1. A detecting device including:

radiation receiving means for receiving radiation from an object and producing an electrical signal related thereto;

focus detecting means for processing said electrical signal produced by said radiation receiving means and effecting detection of the focus, said focus detecting means forming focus related or parametric signals in the course of the processing of said electrical signal; and

relative movement detecting means coupled to said focus detecting means for detecting relative movement between said object and said device by comparing at least one said focus related or parametric signal to a reference signal.

4,527,054

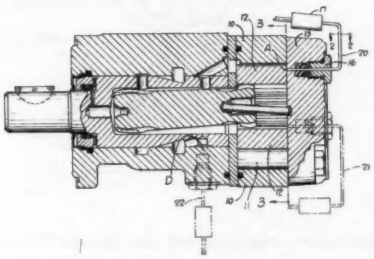
OPTICAL FIBER SENSING DEVICE FOR HYDRAULIC MOTORS

Harvey C. White, 3733 Capilano, West Lafayette, Ind. 47906

Filed Jun. 10, 1982, Ser. No. 387,249

Int. Cl.³ G02B *5/14*

U.S. Cl. 250—227 **6 Claims**



1. In a gerotor, said gerotor having a cavity with a cavity wall and containing a reflective fluid, said gerotor also having a moving part contained within said cavity which moving part describes a path within said cavity during the operation of said gerotor, said moving part having a non-reflective surface and said cavity wall containing a sensing point which is covered by said non-reflective surface of said moving part during a first part of said path of said moving part but which is covered only by said reflective fluid during a second part of said path of said moving part, a sensing device comprising

optical fiber transmission means having a first and a second light path, said first and second light paths being isolated from each other such that light cannot pass from either path to the other inside said transmission means;

said first and second light paths having first and second ends, respectively, at said sensing point in said cavity wall, said ends being adapted, with respect to said two light paths, such that when said moving part is describing the first said part of its said path, thereby covering said sensing point with its said non-reflective surface, light cannot pass from said first to said second light path, but when said moving part is describing the second said part of its said path, thereby permitting said sensing point to be covered only by said reflective fluid, light may pass from said first to said second light path;

a light source associated with said first light path, whereby light is provided to said first light path; and

means for sensing, at any point in time, whether said light is passing to said second light path, and thus for determining periods of time during which said light has passed to said second light path.

4,527,055

APPARATUS FOR SELECTIVELY VIEWING EITHER OF TWO SCENES OF INTEREST

Lloyd B. Harkless, Londonderry, N.H.; William L. McCracken, Wayland, and Joseph A. Colosimo, Lexington, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 15, 1982, Ser. No. 441,572

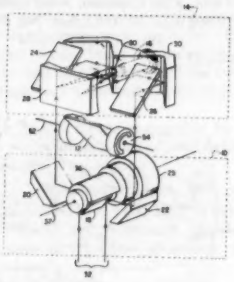
Int. Cl.³ G02B *27/17*

U.S. Cl. 250—234 **13 Claims**

1. An apparatus for detecting radiation received from either a first or a second scene of interest, said apparatus comprising:

A. polygonal scanning spin mirror means coupled to receive said radiation;

B. means for detecting said radiation received by said mirror means; and



C. shutter means coupled to block said radiation from either said first or said second scene of interest from being received by said detection means.

4,527,056

ERROR CORRECTION SYSTEM FOR POSITION MEASURING DEVICE

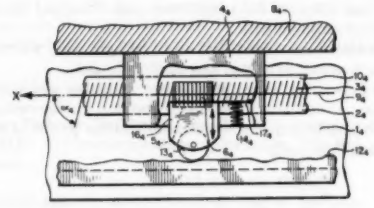
Horst Burkhardt, Truchtlaching, and Günther Nelle, Bergen, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Apr. 27, 1983, Ser. No. 489,250

Claims priority, application Fed. Rep. of Germany, May 4, 1982, 3216616

Int. Cl.³ G01B *5/04, 11/04*

U.S. Cl. 250—237 G **24 Claims**



1. In a length or angle measuring system comprising a measuring graduation which defines a graduation axis extending along the graduation in a measuring direction, and a scanning unit positioned to scan the graduation, wherein means are provided for coupling the graduation and the scanning unit to two relatively movable objects, the improvement comprising:

means, included in the scanning unit, for scanning a first portion of the graduation on a first side of the graduation axis and a second portion of the graduation on a second side of the graduation axis; and

means for varying the weighting given to the first and second portions of the graduation in accordance with a desired error correction pattern.

4,527,057

TEST BODY ARRANGEMENT

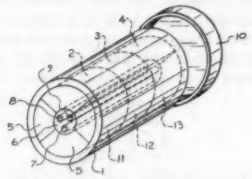
Peter F. Guyton, Elstree, and Albert H. R. Lonn, St. Albans, both of England, assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 22, 1982, Ser. No. 452,186

Claims priority, application United Kingdom, Dec. 23, 1981, 8138716

Int. Cl.³ G01D *18/00*

U.S. Cl. 250—252.1 **6 Claims**



1. A test body for use in checking the performance of apparatus which detects the emission of radiation from a body, the test body comprising an outer tubular casing having disposed therein at least a pair of longitudinally spaced bands of material, each of said bands comprising a plurality of segments with each of said segments having a known level of radiation intensity being incorporated therein.

4,527,058

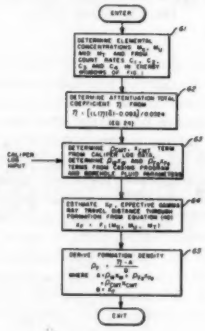
EARTH FORMATION DENSITY MEASUREMENT FROM NATURAL GAMMA RAY SPECTRAL LOGS

Harry D. Smith, Jr., Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 15, 1982, Ser. No. 418,330

Int. Cl.³ G01V *5/06*

U.S. Cl. 250—256 **7 Claims**



1. A method of natural gamma ray spectral logging of earth formations in the vicinity of a fluid filled well borehole to determine formation density, comprising the steps of:

obtaining, with a borehole measurement system, an unknown gamma ray energy spectrum in a measurement borehole having unknown and possibly non-standard borehole conditions, said unknown gamma ray energy spectrum comprising gamma ray intensities measured in at least four energy bands, three of said energy bands corresponding to decay peaks of potassium, uranium and thorium unstable radioactive isotopes, said fourth energy band being selected to monitor changes in the shape of said gamma ray energy spectrum due to borehole and formation conditions;

deriving from said unknown gamma ray energy spectrum by comparing said unknown spectrum with standard gamma ray spectra for unstable isotopes of potassium, uranium and thorium taken in standard boreholes, a measure of the total attenuation coefficient η for measured natural gamma rays occurring in earth formations in the vicinity of the measurement borehole;

determining as a function of said measure of the attenuation coefficient η and predetermined measures of the wellbore fluid, casing program for the wellbore and properties of the cement between the casing and the wellbore, an indication of the density of the earth formations in the vicinity of the well bore; and

repeating the previous steps at a plurality of depths in the borehole and recording said indications of density of the formations as a function of borehole depth, thereby to provide a well log of the formation density as a function of borehole depth.

4,527,059

LASER ACTIVATED MASS SPECTROMETER FOR THE SELECTIVE ANALYSIS OF INDIVIDUAL TRACE-LIKE COMPONENTS IN GASES AND LIQUIDS

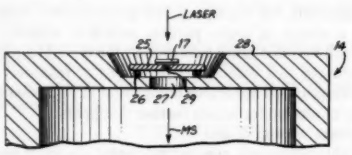
Alfred Benninghoven, Muenster-Roxel; Günther Kämpf, Krefeld, and Reimer Holm, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 388,298, Jun. 14, 1982, Pat. No. 4,468,468. This application Mar. 30, 1984, Ser. No. 595,084

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125335

Int. Cl.³ H01J *39/34*

U.S. Cl. 250—288 **3 Claims**



1. In a laser activated mass spectrometer having a sample holder for holding a given component to be investigated, a laser source for producing a laser beam to evaporate the given component and a vacuum chamber in which the evaporated component is analyzed, the improvement comprising: means for mounting the sample holder and the given component outside the vacuum chamber of the mass spectrometer under atmospheric pressure or in an inert gas atmosphere, wherein the sample holder comprises a polymer carrier film for depositing the component thereon, the carrier film forming part of a wall of the vacuum chamber of the mass spectrometer and means for directing the laser beam onto the deposited component for evaporating the given component and simultaneously forming a hole in the carrier film through which the given component is transferred into the vacuum chamber of the mass spectrometer simultaneously with evaporation.

4,527,060

RADIATION IMAGE READ-OUT METHOD AND APPARATUS

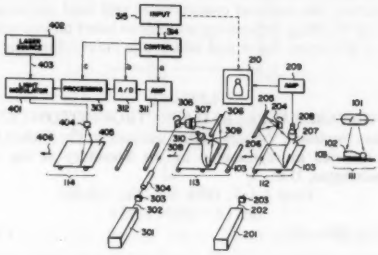
Toshiaki Suzuki, and Kazuo Horikawa, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 18, 1982, Ser. No. 434,886

Claims priority, application Japan, Oct. 16, 1981, 56-165111; Oct. 16, 1981, 56-165112; Oct. 16, 1981, 56-165113; Oct. 16, 1981, 56-165114; Oct. 16, 1981, 56-165115

Int. Cl.³ G03C *5/16*

U.S. Cl. 250—327.2 **23 Claims**



1. In a radiation image read-out method in which a stimulable phosphor sheet which has been subjected to image-wise radiation exposure to produce a radiation image stored thereon is exposed to a stimulating ray which causes the stimulable phosphor sheet to emit light in the pattern of the stored image, and the emitted light is photoelectrically read out, the radiation image read-out method comprising:

prior to final read-out for obtaining a visible image for viewing purposes, conducting preliminary read-out for reading out said radiation image stored on said stimulable phosphor sheet by exposing said stimulable phosphor sheet to a stimulating ray having stimulation energy lower than stimulation energy of a stimulating ray used in said final read-out, the preliminary read-out exposure being conducted subsequent to said image wise radiation exposure.

4,527,061

RADIATION IMAGE READ-OUT METHOD AND APPARATUS

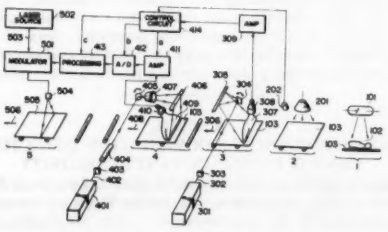
Kazuo Horikawa, and Satoshi Arakawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 24, 1982, Ser. No. 444,148

Claims priority, application Japan, Nov. 25, 1981, 56-188661

Int. Cl.³ G03C *5/16*

U.S. Cl. 250—327.2 **14 Claims**



1. In a radiation image read-out method in which a stimulable phosphor sheet carrying a radiation image stored therein is exposed to stimulating rays, light emitted from said stimulable phosphor sheet upon stimulation thereof is photoelectrically

read out, and a visible radiation image is reproduced by use of the electric signal obtained,

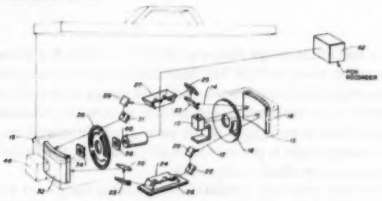
the radiation image read-out method comprising: prior to final read-out for obtaining said visible radiation image for viewing purposes, determining the gradient of a decay curve of said stimulable phosphor sheet by exposing said stimulable phosphor sheet to stimulating rays and detecting the amount of light emitted from said stimulable phosphor sheet upon stimulation thereof, conducting preliminary read-out for reading out image input information stored in said stimulable phosphor sheet by use of stimulating rays having stimulation energy lower than stimulation energy of stimulating rays used in said final read-out, and setting the read-out conditions in said final read-out and/or the image processing conditions based on said gradient of the decay curve and said image input information.

4,527,062

PORTABLE INFRARED SPECTROPHOTOMETER

Thomas Novinson, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 5, 1983, Ser. No. 510,851
Int. Cl.³ G01N *21/35*
U.S. Cl. 250—351 **1 Claim**



1. A portable infrared spectrophotometer for the nondestructive testing and identification of solid organic samples such as plastics, rubber and other organic construction materials, the combination comprising:

a. a source of polychromatic infrared energy in the range of 2–15 microns;

b. means for forming energy from said infrared source into two infrared beams of equivalent optical lengths;

c. means for deflecting one of said infrared beams onto the surface of a sample to be identified;

d. means for reflecting said beam off said sample surface a predetermined number of times;

e. means for deflecting said beam back into its original path;

f. a continuous filter for converting the polychromatic infrared light into monochromatic infrared energy to produce a spectrum of wavelength vs. transmittance;

g. means for recovering said converted beam and converging said reflected beam along with said other beam to impinge on a single detector to generate a signal proportional to the infrared energy absorbed by said sample;

h. said signal being used to drive a pen on a chart recorder.

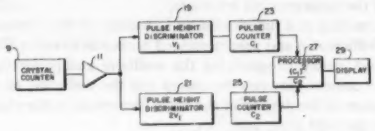
4,527,063

SOLID STATE NUCLEAR RADIATION DETECTOR CIRCUIT WITH CONSTANT SENSITIVITY

Stanley Kronenberg, Skillman, and Robert A. Lux, Toms River, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 6, 1984, Ser. No. 576,992
Int. Cl.³ G01T *1/24*
U.S. Cl. 250—370 **5 Claims**

1. A solid state crystal radiation counter, means to apply the pulse output of said counter to a pair of pulse height discriminators with the threshold voltage of the first of said discriminators set at V_1 volts and the second of said discriminators set at a threshold voltage of $2V_1$ volts, and wherein V_1 volts is above the noise level of said crystal counter, the output of said first and second discriminators being applied respectively to first and second pulse counters, the output of which are applied to



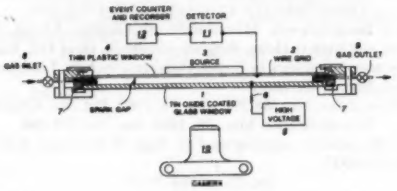
a processor circuit which is arranged to calculate the quotient of the square of the output of said first pulse counter and the output of said second pulse counter to yield a voltage or output which is related to the total number of radiation-related pulses passing through said crystal counter regardless of the charge collection efficiency thereof.

4,527,064

IMAGING ALPHA PARTICLE DETECTOR

David F. Anderson, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 202,042, Oct. 29, 1980,. This application Jul. 5, 1983, Ser. No. 510,388
Int. Cl.³ H01J *47/10*
U.S. Cl. 250—374 **10 Claims**



1. An apparatus for displaying and quantitatively detecting primarily a source of alpha particle emission, whereby improved resolution and noise background for the alpha particle emission display and detection is achieved at relatively low applied voltages, said apparatus comprising in combination:

a. a pair of electrodes which further comprises:

i. a planar wire grid; and

ii. a light transparent, conducting coated electrical insulating flat plate situated parallel to said grid and separated therefrom by at most 0.4 cm, said conducting coating being deposited on the side of said plate facing said grid, said plate further forming a first major side of a gas tight envelope;

b. an alpha particle and light transmitting window adjacent to and parallel to said wire grid, and located on the opposite side of said grid from said plate, said window forming a second major side of said gas tight envelope;

c. means simultaneously secured to said plate and said window for completing said gas tight envelope, and for supporting said electrodes and window;

d. means for introducing and removing target gases from said gas tight envelope, said gases occupying the volume between said window and said conducting coated electrode;

e. means for maintaining said pair of electrodes at particular voltages in order to accelerate electrons released by collisions between alpha particles incident on said volume and

said target gas located therein, therby forming a visible spark discharge; and

f. means for quantitatively detecting and recording said spark discharges resulting from said alpha particle collisions.

4,527,065

CONTAINER FOR THE LONG-TERM STORAGE OF RADIOACTIVE MATERIALS SUCH AS IRRADIATED NUCLEAR FUEL ELEMENTS

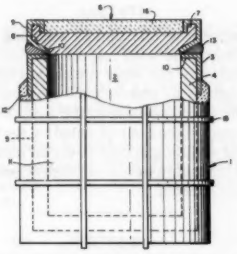
Franz-Wolfgang Popp, Wedemark, and Klaus Rosenbach, Bissendorf, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,935

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1981, 3150711

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—506.1 **6 Claims**



1. A container for the long-term storage of radioactive materials such as irradiated nuclear fuel elements, the container comprising:

a vessel-shaped base body made of a material selected from the group consisting of cast iron and cast steel, said base body having an outer surface and an opening through which the radioactive material to be stored therein is passed;

rib means made of corrosion-resistant material and formed on said surface to partition said surface into a plurality of surface segments;

protective means covering each of said surface segments for protecting the same against corrosion; and,

a cover adapted for sealing said opening of said vessel-shaped base body.

4,527,066

CONCRETE SHIELDING HOUSING FOR RECEIVING AND STORING A NUCLEAR FUEL ELEMENT CONTAINER

Hans-Peter Dyck, Burgdorf; Harry Spilker, Bad Muender, and Heinz-Dieter Gregor, Hanover, all of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,736

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144116

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—507.1 **4 Claims**

1. A concrete shielding housing for receiving and storing a transportable fuel element container which is suitable for storage and filled with spent nuclear reactor fuel elements, the housing comprising:

a pallet-like base;

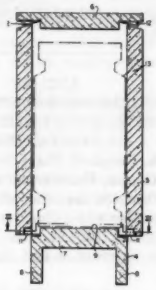
a concrete shielding wall placeable upon said base; and

a removeable cover atop said shielding wall;

the clear interior dimensions of the housing being somewhat greater than the outer dimensions of the container;

air inlet means at the lower region of the housing for admitting air into the interior thereof;

air outlet means at the upper region of the housing for venting air from the interior thereof; and



said base having a profile when viewed in plan smaller than the profile of said shielding wall when viewed in plan so as to cause the shielding wall to overlap the base when placed thereon whereby surface water running down the outer concrete shielding wall surface drips directly onto the ground without it first coming to rest on said base.

4,527,067

CONCRETE SHIELDING HOUSING FOR RECEIVING AND STORING A NUCLEAR FUEL ELEMENT CONTAINER

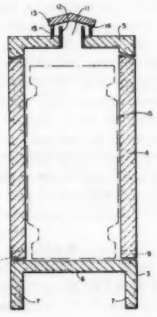
Hans-Peter Dyck, Burgdorf; Harry Spilker, Bad Muender, and Heinz-Dieter Gregor, Hanover, all of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,748

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3144114

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—507.1 **4 Claims**



1. A concrete shielding housing for receiving and storing a transportable fuel element container which is suitable for storage and filled with spent nuclear reactor fuel elements, the housing comprising:

a base; and

a concrete shielding body mounted on said base;

the clear interior dimensions of the housing being somewhat greater than the outer dimensions of the container;

air inlet means at the lower region of the housing for admitting air into the interior thereof:
air outlet means at the highest location of said shielding body for venting air from the interior of said housing;
a cover arranged over said air outlet means so as to be in spaced relationship to said shielding body; and,
labyrinth baffle means disposed in surrounding relationship to said air outlet means for conducting the air vented through said air outlet means along a labyrinth-like path to the ambient.

4,527,068

CONCRETE SHIELDING HOUSING FOR RECEIVING AND STORING A NUCLEAR FUEL ELEMENT CONTAINER

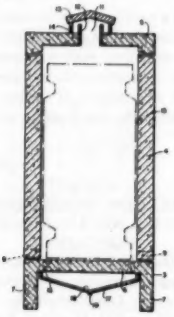
Hans-Peter Dyck, Burgdorf; Harry Spilker, Bad Muender, and Heinz-Dieter Gregor, Hanover, all of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kerbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,749

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144115

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—507.1 **4 Claims**



1. A concrete shielding housing for receiving and storing a transportable fuel element container which is suitable for storage and filled with spent nuclear reactor fuel elements, the housing comprising:
a pallet-like base having a base plate;
the housing having clear interior dimensions somewhat larger than the outer dimensions of the container;
air inlet means formed in the lower portion of said housing for admitting air into the interior thereof;
air outlet means formed in the upper portion of said housing for conducting air from said interior to the ambient;
bore means formed in said base plate; and
collection means arranged beneath said base plate and communicating with said bore means for receiving and collecting moisture formed in said interior of said housing.

4,527,069

DEVICE FOR CONTROLLING THE LATERAL POSITION OF A WEB IN A WEB PRINTING MACHINE

Wolfgang Pfizenmaier, Neckargemünd, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

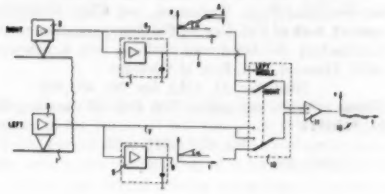
Filed Sep. 30, 1982, Ser. No. 431,634

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142316

Int. Cl.³ G01H *21/86*

U.S. Cl. 250—548 **3 Claims**

1. In a web printing machine, a device for controlling with adjusting members and a measuring device the lateral position of a web traveling rectilinearly in a given plane in the web printing machine, the controlling device having respective optical scanning systems for detecting respective opposite edges of the web on both sides thereof and the respective positions of the edges and, upon lateral shifting of the web, activating the adjusting members for correcting the position of the web in accordance with a nominal value, comprising a respective bandpass filter connected to each of the optical scanning systems, and means for detecting a long-term change in the control signal by the bandpass filter of one of the optical



scanning systems, the one optical scanning system being in position yet being idle with respect to controlling the lateral position of the web, the other optical scanning system being active with respect to scanning the respective web edge for controlling the lateral position of the web, the detection of the long-term change in the control signal by the bandpass filter of the one optical scanning system being an indication of fouling of the optical scanning systems, whereby compensation for the fouling may be effected.

4,527,070

METHOD AND APPARATUS FOR INSPECTING A PATTERN

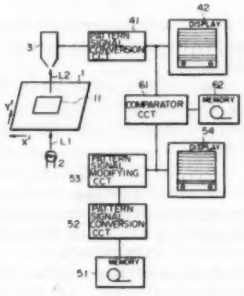
Shougo Matsui, Sagamihara; Yoshimitu Mashima, Kawasaki, and Kenichi Kobayashi, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 20, 1982, Ser. No. 409,983

Claims priority, application Japan, Aug. 20, 1981, 56-131276

Int. Cl.³ G01N *21/86*

U.S. Cl. 250—560 **12 Claims**



4. An apparatus, operatively connected to a memory for storing predetermined reference pattern data, the pattern being produced from pattern data of a predetermined reference pattern, the predetermined reference pattern having corners, for inspecting a pattern supported by a stage, comprising:
scanning means for scanning the pattern and outputting a scanning signal corresponding to the pattern;
a pattern signal conversion circuit, operatively connected to said scanning means, for receiving the scanning signal and generating a pattern signal;
a reference pattern signal conversion circuit, operatively connected to the memory, for receiving the predeter-

mined reference pattern data and outputting a converted signal; a pattern signal modifying circuit, operatively connected to the reference pattern signal conversion circuit, for modifying the pattern signal of the predetermined reference pattern and generating a modified pattern signal, accordingly, the modified pattern signal corresponding to a permissible pattern which is formed by deleting the corners from the predetermined reference pattern;

a comparator, operatively connected to said pattern signal modifying circuit and said pattern signal conversion circuit, for receiving the modified pattern signal and the pattern signal and outputting a signal corresponding to the difference between the modified pattern signal and the pattern signal; and

first and second pattern display devices, operatively connected to said reference pattern signal conversion circuit and said pattern signal modifying circuit, for receiving and displaying the modified pattern signal and the pattern signal, respectively.

4,527,071

MODULAR POWER PLANT FOR THE COMBINED PRODUCTION OF ELECTRICAL AND THERMAL ENERGY AND INSTALLATION COMPRISING A PLURALITY OF MODULAR POWER PLANTS

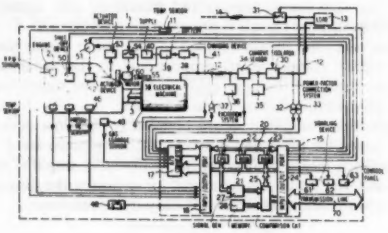
Francesco P. Ausiello, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed May 9, 1983, Ser. No. 492,754

Claims priority, application Italy, May 7, 1982, 67006 A/82

Int. Cl.³ F02N *11/06*; H02J *3/04*

U.S. Cl. 290—4 R **2 Claims**



1. A modular power plant for the combined production of electrical and thermal energy, comprising:

(a) a liquid-cooled internal combustion engine;

(b) an asychronous electrical machine coupled to said internal combustion engine and usable both to start the engine and to generate electrical energy,

(c) means for recovering the energy converted into heat in the said internal combustion engine and in said electrical machine,

(d) alarm and signalling devices;

(e) an electronic control and protection system comprising a plurality of electrical sensors each responsive to a respective parameter indicative of the conditions of operation of the power plant, a plurality of actuator devices operable in a predetermined manner to modify the operation of the power plant, and an electronic processing and control unit arranged to operate in a first mode when the power plant is used alone, and to operate in a second mode when the power plant is used together in a coordinated manner with a further n power plants, n being a whole number greater than or equal to 1; the said control and processing unit in the said first mode of operation, controlling the said actuator devices to operate in a predetermined manner in dependence on information provided by the said sensors and activating the said signalling and alarm devices when the sensors indicate operational anomalies or breakdowns, the said processing and control unit comprising:

a manually-operated activation device arranged to emit an enabling signal when operated;

at least one input/output port connectable via a transmission path to corresponding input/output ports of the processing and control units of the other power plants,

memory means for memorizing coded electrical signals indicative of an integer between 1 and n+1 which is unique to the power plant;

signal generator means arranged, when activated, to feed to the said input/output port coded electrical signals indicative of a randomly chosen number between 1 and n+1; and

detection and comparison means connected to the said input-/output port and to the said memory means; the processing and control unit in the second mode of operation being arranged to

(i) operate as a master unit for controlling and coordinating the operation of the control and processing units of the other n power plants in a predetermined manner when the coded signals received by said detection and comparison means coincide with those stored in the said memory means; and

(ii) operate as a slave unit controlled by another control and processing unit of one of the other n power plants, when the coded signals received by the detection and comparison means do not coincide with those stored in the memory means.

4,527,072

DIVISIBLE CABIN FOR A WINDMILL

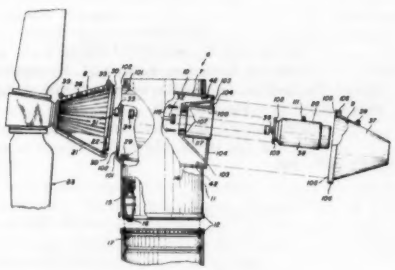
Peter M. van Degeer, Breukelen, Netherlands, assignor to FDO Technische Adviseurs B.V., Netherlands

Filed Dec. 29, 1982, Ser. No. 454,350

Claims priority, application Netherlands, Mar. 26, 1982, 8201283

Int. Cl.³ F03D *11/04*

U.S. Cl. 290—55 **7 Claims**



1. A cabin for use in a windmill which has a horizontal rotor shaft and generator means coupled to said horizontal shaft for the generation of electricity, comprising:

an enclosed carrying structure rotatably supported on a top end of a stationary mill shaft;

said enclosed carrying structure comprising a first rigid, self-supporting cabin part, and second and third rigid self-supporting cabin parts independently separable from said first cabin part;

said second cabin part comprising means for supporting a rotor externally thereof and means for supporting at least a portion of said horizontal shaft and gears for driving said generator means internally thereof, said second cabin part, said rotor, said gears and said horizontal shaft portion being separable as a unit from said first cabin part;

said first cabin part comprising means for detachably housing said generator means, and said third cabin part comprising a cover for a portion of said generator means, said third cabin part being separable from said first cabin part

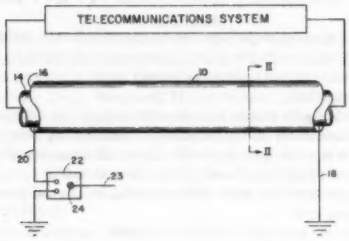
for facilitating removal of said generator means from said first cabin part.

4,527,073

SHIELDED ELECTRICAL CABLE SYSTEM

William R. Carroll, 8100 University Dr., Richmond, Va. 23229

Filed Nov. 22, 1983, Ser. No. 554,217
Int. Cl.[3] H04B *3/28;* H03H *11/44*
U.S. Cl. 307—90 **3 Claims**



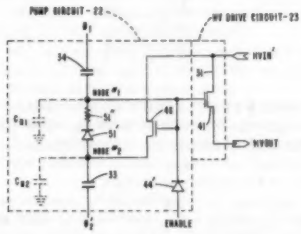
1. In a shielded electrical cable system, a length of a cable having a plurality of internal conductors and a surrounding metal shield, means to induce negative impedance, means connecting one end of the shield in said length of cable through said negative impedance means to ground, and means for connecting to ground the other end of the shield in said length of cable, said negative impedance means having a negative impedance substantially equal to the electrical resistance along the length of the shield between said ground connections, plus the electrical resistances along the lengths of said connections from shield to ground, whereby conductors in said length of cable are substantially shielded from any voltage inducing effect of electromagnetic fields of any adjacent power line carrying alternating current.

4,527,074

HIGH VOLTAGE PASS CIRCUIT

Darrel D. Donaldson, Kettering; Edward H. Honnigford, and Alan D. Poeppelman, both of Dayton, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 7, 1982, Ser. No. 433,292
Int. Cl.[3] H03K *17/06, 17/687*
U.S. Cl. 307—246 **10 Claims**



1. A high voltage pass circuit for selectively connecting an input line to an output line, comprising:

means for coupling an input voltage on said input line to said output line in response to a first voltage on a first capacitive node, when said first voltage exceeds said input voltage;

means for transferring charge from said input line to a second capacitive node, when said first voltage exceeds the voltage on said second capacitive node; and

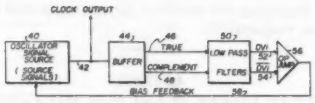
pump means for repetitively transferring charge unidirectionally from said second capacitive node to said first capacitive node.

4,527,075

CLOCK SOURCE WITH AUTOMATIC DUTY CYCLE CORRECTION

Terry B. Zbinden, Maple Grove, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,255
Int. Cl.[3] H03L *1/00;* H03K *3/03, 5/26*
U.S. Cl. 307—265 **19 Claims**



1. A clock source comprising:

signal source means for providing source signals at a predetermined frequency;

buffer means coupled to said signal source means for receiving said source signals and providing true signals and complement signals representative thereof;

low pass filter means coupled to said buffer means for providing voltage levels proportional to the instantaneous deviation of the duty cycle of said source signals from a predetermined duty cycle reference;

differential amplifier means coupled to said low pass filter means for providing duty cycle error signals; and

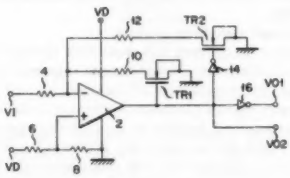
feedback means coupled to said differential amplifier means and said signal source means for adjusting the duty cycle toward said predetermined duty cycle reference.

4,527,076

SIGNAL LEVEL COMPARING CIRCUIT

Kenji Matsuo, and Minoru Takata, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 10, 1982, Ser. No. 440,732
Claims priority, application Japan, Nov. 16, 1981, 56-183273
Int. Cl.[3] H03K *5/153, 5/01, 5/08*
U.S. Cl. 307—362 **6 Claims**



1. A signal level comparing circuit comprising:

first and second power supply terminals respectively set at first and second preset potentials;

comparing means connected between said first and second power supply terminals to be operated on a power supply voltage between said first and second power supply termi-

nals, and having a first input terminal to be set at a reference potential lying between the first and second preset potentials and a second input terminal;

a signal input terminal;

first resistive means connected between said signal input terminal and said second input terminal of said comparing means;

a first series circuit having first switching means and second resistive means and connected between the second input terminal of said comparing means and said second power supply terminal; and

a second series circuit having second switching means and third resistive means and connected between the second input terminal of said comparing means and said second power supply terminal; said first and second switching means being set to opposite conduction states from each other in response to an output signal from said comparing means, and a total resistance of said second resistive means and said first switching means in the ON state being set different from a total resistance of said third resistive means and said second switching means in the ON state.

4,527,077

OUTPUT CIRCUIT OF A SEMICONDUCTOR DEVICE

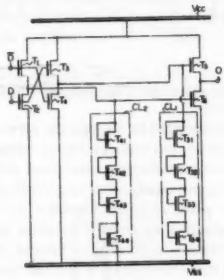
Mitsuo Higuchi, Tokyo, and Masanobu Yoshida, Kawaguchi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 30, 1982, Ser. No. 393,551

Claims priority, application Japan, Jun. 30, 1981, 56-100509

Int. Cl.³ H03K *19/003, 19/017, 17/16*

U.S. Cl. 307—443 **5 Claims**



1. An output circuit of a semiconductor device having a power supply line and a ground line and operatively connected to receive first and second signals, each of the first and second signals having a high or low-potential level, comprising:

a first MIS transistor having a gate operatively connected to receive the first signal;

a second MIS transistor operatively connected in series with said first MIS transistor and between the power supply line and the ground line, and having a gate operatively connected to receive the second signal, said first and said second MIS transistors being turned on and off or being turned off and on, respectively, in response to the high-potential level or the low-potential level of the first and second signals;

an output terminal operatively connected to a connecting point between said first and said second MIS transistors; and

a clamping circuit, directly connected to said gates of said first and second MIS transistors, for clamping the potentials of the first and second signals to within a predetermined level.

4,527,078

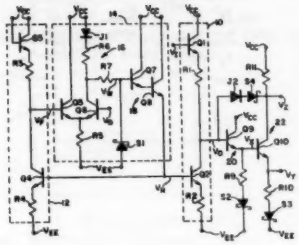
SIGNAL TRANSLATOR WITH SUPPLY VOLTAGE COMPENSATION PARTICULARLY FOR USE AS INTERFACE BETWEEN CURRENT FREE LOGIC AND TRANSISTOR TRANSISTOR LOGIC

Douglas D. Smith, Puyallup, Wash., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Aug. 23, 1982, Ser. No. 410,225

Int. Cl.³ H03K *19/092, 19/003, 17/14*

U.S. Cl. 307—475 **21 Claims**



16. A signal translator for converting an input signal into an output signal at a different voltage level in which: there are first, second, third, and fourth like-polarity transistors, each having first and second flow electrodes and a control electrode for regulating current transmission between the flow electrodes; the control electrode of the first transistor receives the input signal; the second electrode of the second transistor provides the output signal; an impedance element is coupled between the first electrode of the first transistor and the second electrode of the second transistor; an impedance element is coupled between the first electrode of the third transistor and the second electrode of the fourth transistor; the first and third transistors have their second electrodes coupled to a source of a first supply voltage; and the second and fourth transistors whose control electrodes respond to a common reference voltage have their first electrodes coupled to a source of a second supply voltage; characterized by:

means for maintaining a specified substantially constant voltage between the control electrode of the third transistor and the source of the first supply voltage, the input signal being defined relative to the first supply voltage; and

feedback means responsive to a feedback signal at the second electrode of the fourth transistor for providing the common reference voltage at such a value as to compensate in the output signal for changes in the first supply voltage relative to the second supply voltage.

4,527,079

INTEGRATED CIRCUIT DEVICE ACCEPTING INPUTS AND PROVIDING OUTPUTS AT THE LEVELS OF DIFFERENT LOGIC FAMILIES

Michael D. Thompson, Los Gatos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 1, 1983, Ser. No. 547,819

Int. Cl.³ H03K *19/092, 19/01*

U.S. Cl. 307—475 **12 Claims**

1. In a semiconductor chip, an integrated circuit device comprising:

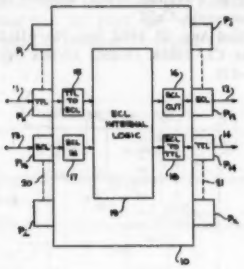
(a) means for accepting the input of first signals at the level of a first logic family to produce second signals at the level of said first logic family;

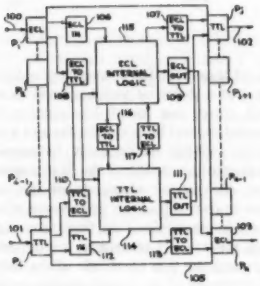
(b) means for accepting the input of third signals at the level of a second logic family to produce fourth signals at the level of said first logic family;

(c) circuit means, operative at the level of said first logic family for operating upon said second signals and said

fourth signals to produce fifth signals and sixth signals, respectively, at the level of said first logic family;

(d) means for providing an output of seventh signals at the level of said first logic family in response to said fifth signals; and





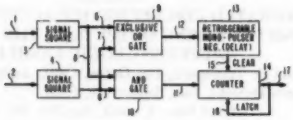
(e) means for providing an output of eighth signals at the level of said second logic family in response to said sixth signals.

4,527,080

DIGITAL PHASE AND FREQUENCY COMPARATOR CIRCUIT

Walter L. Zweig, Rockaway, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 18, 1983, Ser. No. 514,476
Int. Cl.³ H03K *5/153, 12/00, 19/21*
U.S. Cl. 307—510 **9 Claims**



6. A frequency and phase comparator comprising

first means for squaring an AC line voltage,

second means for squaring an AC reserve voltage,

AND gate means for ANDing outputs of the first and second means,

counting means responsive to an output of the AND gate means by accumulating a count, and providing an output when a threshold count is attained,

exclusive OR gate means for exclusive ORing outputs of the first and second means,

pulse generation means responsive to an output of the exclusive OR gate means, the pulse generation means having a property of generating an output pulse only if an input pulse of one polarity supplied from the exclusive OR gate means exceeds a preset time duration,

means for utilizing an output of the pulse generation means to clear the counting means of an accumulated count, and

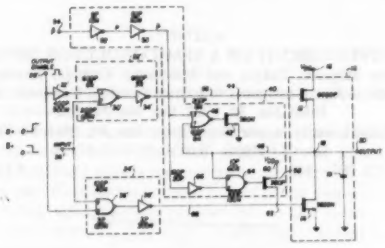
output means for signaling attainment of the threshold count in the counting means.

4,527,081

OVERSHOOT PREDRIVEN SEMI-ASYNCHRONOUS DRIVER

Roger G. Stewart, Neshanic Station, N.J., assignor to The United States of America as represented by the Scretary of the Army, Washington, D.C.

Filed Feb. 11, 1983, Ser. No. 465,851
Int. Cl.³ H03K *3/01, 17/687*
U.S. Cl. 307—270 **20 Claims**



1. A high speed signal propagation circuit, comprising:

an output terminal;

an output stage coupled to said output terminal and including a first and second semiconductor device, each having a pair of current conducting electrodes defining a current path and a control electrode for controlling the current in said current path, coupled together by means of their current conducting electrodes between first and second reference voltages and being rendered alternately conducting and non-conducting in mutual opposition to provide a multi-level output signal at said output terminal;

an input terminal;

a first signal control path coupled between said input terminal and the control electrode of the first semiconductor device of said output stage and being operable to control the conductive state of the first semiconductor device in response to an input signal applied to said input terminal;

a second signal control path coupled between said input terminal and the control electrode of the second semiconductor device of said output stage and being operable to control the conductive state of the second semiconductor device in response to said input signal; and

anticipatory circuit means coupled to the control electrode of both of said semiconductor devices and including feedback circuit means coupled to said output terminal and generating a feedback signal from said output signal for setting the voltage level at the control electrode of the non-conducting semiconductor device of said first and second semiconductor device at a point somewhat less than the point of conduction of the non-conducting device in response to the level of said feedback signal for enhancing the speed of transition between non-conducting and conducting states of said semiconductor devices.

4,527,082

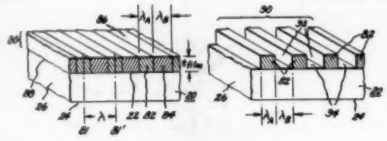
SURFACE ACOUSTIC WAVE DEVICE FROM EUTECTIC DEPOSIT

Harvey E. Cline, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 395,778, Jul. 6, 1982,. This application Sep. 12, 1983, Ser. No. 531,514

Int. Cl.³ H03H *9/25*

U.S. Cl. 310—313 B **5 Claims**



1. In a surface acoustic wave device having at least two transducers situated on the surface of a body of single crystal piezoelectric material, each transducer comprising a first comb-like structure interdigitated with and electrically insulated from a second comb-like structure, each said comb-like structure comprising a spaced array of linear metallic elements electrically interconnected at one end by means of a metallic interconnect, the improvement which comprises as the metallic elements of one of the spaced arrays the metallic phase of composition substantially corresponding to one of the phases of a metallic eutectic alloy system and the widths of the metallic elements of arrays being less than 0.33 micron.

4,527,083

GAS AND/OR VAPOR DISCHARGE LAMP PROVIDED WITH A U-SHAPED DISCHARGE TUBE

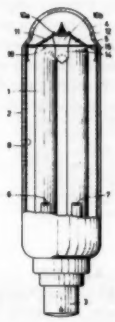
Herbert K. M. Op De Beeck; Joannes M. T. Peeters, both of Eindhoven, Netherlands, and Peter K. R. M. Steeman, Turnhout, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 425,215

Claims priority, application Netherlands, Oct. 8, 1981, 8104587

Int. Cl.³ H01J *61/34, 61/74*

U.S. Cl. 313—25 **6 Claims**



1. A gas and/or vapor discharge lamp provided with a U-shaped discharge tube and an elongate outer envelope surrounding said tube, a bend of said discharge tube interconnects the two limbs thereof, said discharge tube being supported with respect to the outer envelope by means of a metal member fabricated of sheet material, said metal member having a flat annular part which is disposed mainly transverse to the longitudinal direction of the outer envelope and is provided with four strips bent out of its plane, at least two strips engaging the bend of said discharge tube, said metal member being composed of at least two separate parts, the first part being the annular part with the strips and a second part comprising a hood-shaped portion which surrounds the outer side of said bend of said discharge tube, said parts of said member being dimensioned and configured with respect to each other to provide a substantially light-tight transverse separation between said outer envelope and said discharge tube.

4,527,084

RADIATION COUNTER

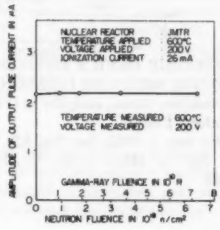
Nasuki Wakayama, 765-1, Oaza Funaishikawa, Tokaimura, Nakaimura, Nakagun, Ibaragi, Japan

Filed Apr. 20, 1979, Ser. No. 31,921

Claims priority, application Japan, Apr. 21, 1978, 53-47291

Int. Cl.³ H01J *47/00*

U.S. Cl. 313—93 **1 Claim**


NUCLEAR REACTOR : JMTR
TEMPERATURE APPLIED : 600°C
VOLTAGE APPLIED : 200 V
IONIZATION CURRENT : 26 mA
TEMPERATURE MEASURED : 600°C
VOLTAGE MEASURED : 200 V
GAMMA-RAY FLUENCE IN 10⁸ R
AMPLITUDE OF OUTPUT PULSE CURRENT IN mA
NEUTRON FLUENCE IN 10¹⁰ n/cm²

1. A radiation counter comprising; counter electrodes made of nickel base super alloy containing the nickel in the weight ratio exceeding 30% and not exceeding 90% and the chrome, the iron, and other constituents as the balance; and counter gas in which the argon gas is the chief ingredient and with which the nitrogen gas is mixed in the volume ratio exceeding 2% and not exceeding 30%, whereby the radiation counter operates stably at a high temperature atmosphere exceeding 450° C. and affords relatively large pulse output current and short electron-collection-time.

4,527,085

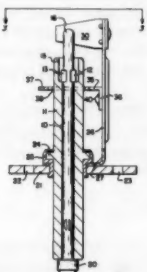
HIGH VOLTAGE SPARK ELECTRODE STRUCTURE

John E. Bohan, Jr., Minneapolis; Ulrich Bonne, Hopkins, and Dane M. Weber, Coon Rapids, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 22, 1983, Ser. No. 468,265

Int. Cl.³ H01T *13/04;* **F23Q** *3/00, 3/70*

U.S. Cl. 313—128 **6 Claims**



1. A high voltage spark electrode structure connected to high voltage spark generating circuit means which includes a high voltage source and a series connected voltage break down device, including: a spark electrode adapted to be connected to said spark generating circuit means; insulator means being

continuous in length and enclosing a portion of said spark electrode with said insulator means leaving an end portion of said electrode exposed to form one side of a spark gap; conductive mounting means attached to said insulator means remote from said exposed electrode with part of said mounting means forming a second side of said spark gap; said mounting means adapted to mount said electrode structure on a surface that is at an electrical potential different than said spark electrode; and conductive means having a small cross section connected to said second side of said spark gap; said conductive means mounted adjacent said insulator means and spaced from said spark electrode; said conductive means being sufficiently spaced from said electrode to prevent arcing to said conductive means from said spark electrode while reducing the magnitude of said high voltage source of voltage to less than said 10,000 volts to create sparking across said spark gap.

4,527,086

ARC DISCHARGE DEVICE WITH IMPROVED ISOTOPIC MIXTURE OF MERCURY

Jakob Maya, Brookline, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 2, 1983, Ser. No. 528,717
Int. Cl.³ H01J *61/42, 61/20*
U.S. Cl. 313—485 **9 Claims**

1. In a mercury-containing arc discharge device for converting electrical energy into resonance radiation, the ^{196}Hg isotope content of the mercury within the device being greater than that in natural mercury in order to increase the efficiency of converting said electrical energy into said resonance radiation but equal to or less than 1% enrichment of ^{196}Hg, the heavy mercury isotopes of at least ^{200}Hg, ^{201}Hg and ^{202}Hg having a content on the order of $\frac{1}{3}$ of natural mercury.

4,527,087

FLUORESCENT LAMP

Akira Taya, Kawasaki; Kazuo Narita, Tokyo; Jun-etsu Akiyama; Masao Asada, both of Yokohama, and Hisami Nira, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 30, 1982, Ser. No. 413,242
Claims priority, application Japan, Sep. 3, 1981, 56-1378838
The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.
Int. Cl.³ H01J *61/44*
U.S. Cl. 313—487 **3 Claims**

1. A fluorescent lamp which comprises a glass tube and a mixture of a phosphor (i) comprising an alkaline earth metal halophosphate phosphor activated with divalent europium, represented by the formula:

$$M_{5-x}X(PO_4)_3:Eu^{2+}{}_{(x)}$$

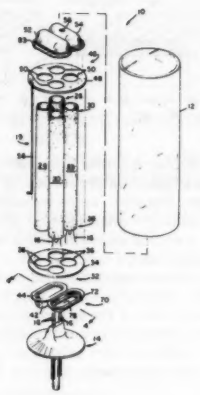
wherein M consists of 3 to 4.5 gram-atom of barium, 0.5 to 2 gram-atom of calcium and 0.01 to 1 gram-atom of magnesium; X is one or more of fluorine, chlorine or bromine; and x is a positive value of more than 0.01 and not more than 0.2, said phosphor (i) having an emission peak in the wavelength region of 480 to 500 nm and exhibiting a higher luminsecent intensity than said phosphor (i) absent magnesium; and a phosphor (ii) having an emission peak in the wavelength region of 620 to 640 nm and a half width of 120 to 160 nm, said mixture being coated inside of said glass tube.

4,527,088

METAL ARC DIRECTOR FOR COMPACT FLUORESCENT LAMP

Andre C. Bouchard, Peabody; Jakob Maya, Brookline; Fred Loughridge, Ipswich; Charles W. Andress, Danvers, and Julian Wierzbicki, Peabody, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 1, 1983, Ser. No. 481,204
Int. Cl.³ H01J *61/30, 61/35*
U.S. Cl. 313—493 **4 Claims**



1. In a fluorescent lamp having an hermetically sealed outer envelope containing an arc generating and sustaining medium; an assembly positioned within said envelope, said assembly comprising a plurality of elongated glass tubes each having first and second ends, said tubes being coated on their interior surface with a phosphor, all of said interior surfaces being open to said medium; at least one arc directing means operatively associated with said first ends of said tubes, said arc directing means forming a part of the arc path through said tubes; an electrode at either end of said arc path; and means for making electrical connection to said electrodes, the improvement wherein: said arc directing means comprises a relatively thick, rigid, electrically conductive base member having a plurality of apertures therein, some of the apertures including means formed to receive said electrodes and other of said apertures including means formed to receive the first ends of tubes that do not contain electrodes; and an arc director associated with said other apertures.

4,527,089

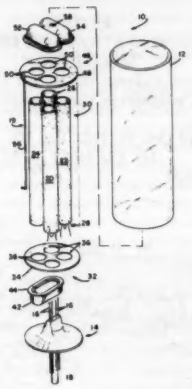
COMPACT FLUORESCENT LAMP

Andre C. Bouchard, Peabody, and Jakob Maya, Brookline, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 1, 1983, Ser. No. 481,230
Int. Cl.³ H01J *61/30, 61/35*
U.S. Cl. 313—493 **9 Claims**

1. A fluorescent lamp comprising: a hermetically sealed outer envelope containing an arc generating and sustaining medium; an assembly positioned within said envelope, said assembly comprising a plurality of elongated glass tubes each having first and second ends, said tubes being coated on their interior surface with a phosphor, all of said interior surfaces being open to said medium; first and second arc directing

means operatively associated with said first and second ends of said tubes to provide a continuous arc path through said tubes;



an electrode at either end of said arc path; and means for making electrical connection to said electrodes.

4,527,090

THYRATRON CAPABLE OF REVERSE CONDUCTION

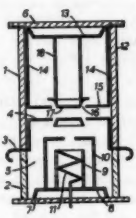
Hugh Menown; Barry P. Newton, and Christopher V. Neale, all of Chelmsford, England, assignors to English Electric Valve Company Limited, Chelmsford, England

Division of Ser. No. 18,278, Mar. 7, 1979, abandoned. This application Sep. 9, 1983, Ser. No. 530,693

Claims priority, application United Kingdom, Mar. 9, 1978, 9306/78; Fed. Rep. of Germany, May 9, 1978, 282020

Int. Cl.³ H01J *17/10, 17/44, 17/54*

U.S. Cl. 313—592 **8 Claims**



1. In a thyratron structure comprising an envelope and, housed therein, a heated cathode means for preparing the thyratron to conduct forwardly, anode means for trapping and retaining plasma generated during a pulse of forward conduction from said anode means to said cathode means, and a control grid whereby a pulse of forward conduction of the thyratron is initiated by a trigger pulse applied to said control grid, the improvement wherein said anode means prepares the thyratron to conduct protectively in the reverse direction when a pulse of conduction ceases if said thyratron is subjected to a reversal of voltage between said cathode means and said anode means, said anode means being devoid of a heater and cathode material whereby conduction in said reverse direction is prepared solely by the plasma trapped and retained in said anode means.

4,527,091

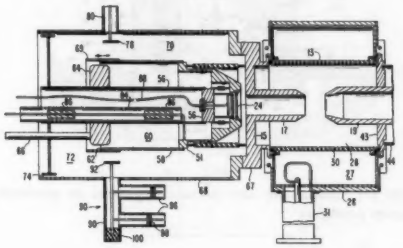
DENSITY MODULATED ELECTRON BEAM TUBE WITH ENHANCED GAIN

Donald H. Preist, San Mateo, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 9, 1983, Ser. No. 502,431

Int. Cl.³ H01J *25/02*

U.S. Cl. 315—5 **19 Claims**



1. A linear-beam electron tube comprising:

a cathode with an electron-emissive surface,

an electron-permeable conductive grid spaced from said emissive surface and generally parallel to said emissive surface,

means for applying an electromagnetic field of a desired radio frequency between said grid and said cathode for generating a current-modulated beam of electrons emerging said grid,

an anode spaced from said grid opposite said cathode, said anode comprising an aperture for passage of said beam,

said means for applying said radio-frequency field comprising resonant means for applying from a single source a first field between said cathode and said grid and a second field between said grid and said anode, said first and second fields being approximately of opposite phases with respect to the direction of flow of said beam, thus providing for regenerative unloading of said source,

a hollow conductive drift tube for transmission of said beam from said anode aperture away from said cathode,

a gap in said drift tube for applying the electromagnetic field of a surrounding cavity, resonant near said desired frequency, across said gap, the length of said drift tube between said aperture and the beginning of said gap being greater than the diameter of said drift tube, whereby the space between said grid and said anode is substantially shielded from fields of said cavity, and

means for collecting said beam downstream of said gap.

4,527,092

MULTISTAGE SPENT PARTICLE COLLECTOR AND A METHOD FOR MAKING SAME

Ben T. Ebihara, Strongsville, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 30, 1983, Ser. No. 537,615

Int. Cl.³ H01J *23/02, 25/34, 9/00*

U.S. Cl. 315—5.38 **17 Claims**

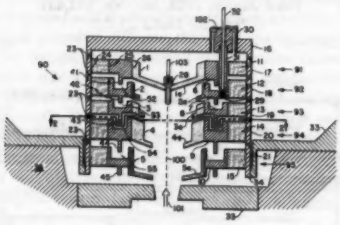
1. A collector for spent, charged particles, said collector being attached to an exit wall of a charged particle source, said exit wall including an aperture through which spent charged particles are injected into the collector which comprises:

a metal cylindrical collector housing having an open end attached to said exit wall and also having a closed end;

at least one collector stage disposed axisymmetrically in said collector and comprising an inner collector ring of pyrolytic graphite, a transition ring of high conductivity, ductile metal and an outer ring of ceramic, the rings being in intimate contact with one another, with the outer ring

being also in heat conducting contact with said collector housing;

said transition ring being divided into arcuate segments by a plurality of radially extending slots, and



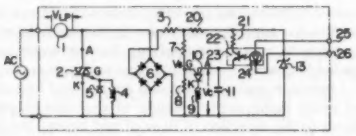
means for maintaining said arcuate segments in predetermined positions.

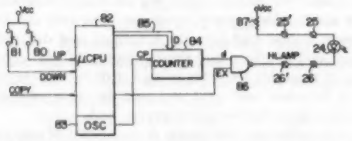
4,527,093

EXPOSURE AMOUNT CONTROL DEVICE FOR A COPYING MACHINE

Koji Yamauchi, Hitachi; Shoichi Ito, Ibaraki, and Hiroyuki Tadokoro, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 546,095
Claims priority, application Japan, Oct. 29, 1982, 57-188956
Int. Cl.[3] H05B *39/09*; G03B *27/72*
U.S. Cl. 315—307 **2 Claims**





1. An exposure amount control device for a copying machine comprising:

(a) exposure amount control means for controlling an exposure amount by controlling light of an exposure lamp for illuminating an original document to be copied; and

(b) digital light control signal generating means for supplying a digital light control signal of a variable duty factor to said exposure amount control means;

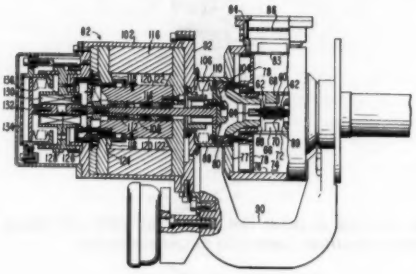
wherein said digital light control signal generating means includes a light intensity increase switch, a light intensity decrease switch, a microcomputer, a frequency dividing counter and an oscillator, said light intensity increase switch and said light intensity decrease switch being connected to input terminals of said microcomputer, bus means for supplying data from said microcomputer to said frequency dividing counter, means for supplying a clock pulse from said oscillator to said frequency dividing counter, means for supplying an output signal of said frequency dividing counter to a first input terminal of a NAND circuit, means for applying a LAMP ON signal to a second input terminal of said NAND circuit, and means for supplying an output signal of said NAND circuit to said exposure amount control means as said digital light control signal.

4,527,094

ALTITUDE COMPENSATION FOR FREQUENCY AGILE MAGNETRON

William A. Gerard, Andover, and Robert J. Foreman, Newbury, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 19, 1982, Ser. No. 435,176
Int. Cl.[3] H01J *25/50*
U.S. Cl. 315—39.55 **24 Claims**



1. A tunable, resonant cavity device comprising:

a device vacuum envelope enclosing a sealed vacuum chamber;

a resonant cavity located within said device vacuum envelope;

tuning means for altering the resonant frequency of said cavity comprising

a first deformable assembly for transmitting motion through said device vacuum envelope,

tuning plunger means positioned in said device vacuum envelope and coupled to said first deformable assembly,

actuating means positioned outside said device vacuum envelope for moving said tuning plunger means,

tuning shaft means coupled between said actuating means and said first deformable assembly, and

compensation means positioned outside and not in fluid connection with said device vacuum envelope and operative to exert a force on said tuning shaft means which opposes the force thereon resulting from atmospheric pressure upon said first deformable assembly, said compensation means comprising a compensation vacuum envelope and a second deformable assembly coupled between said compensation vacuum envelope and said tuning shaft means so as to vary the volume of said compensation vacuum envelope in response to movement of said tuning shaft means.

8. A tunable, crossed field electron discharge device comprising:

cathode means including a cathode for generating a stream of electrons;

a device vacuum envelope for maintaining a vacuum about said stream;

microwave circuit means for supporting electromagnetic fields in interactive relationship with said stream of electrons;

means for coupling electromagnetic wave energy from said circuit means;

means for applying an electric field between said cathode means and said circuit means;

means for applying a magnetic field perpendicular to said electric field in the region of said stream;

tuning means for altering the resonant frequency of said device comprising

a first bellows assembly for transmitting motion through said device vacuum envelope,

tuning plunger means positioned in said device vacuum envelope and coupled to said first bellows assembly,

actuating means positioned outside said device vacuum envelope for moving said tuning plunger means,

tuning shaft means coupled between said actuating means and said first bellows assembly, and

compensation means positioned outside and not in fluid connection with said device vacuum envelope and operative to exert a force on said tuning shaft means which opposes the force thereon resulting from atmospheric pressure upon said first bellows assembly, said compensation means comprising a compensation vacuum envelope and a second bellows assembly sealed to said compensation vacuum envelope and coupled to said tuning shaft means so as to vary the volume of said compensation vacuum envelope in response to movement of said tuning shaft means.

4,527,095

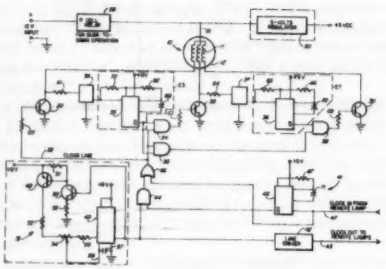
LAMP CIRCUIT APPARATUS

Robert W. Herring, 707 Tropic Hill, Altamonte Springs, Fla. 32701

Filed Jul. 28, 1982, Ser. No. 402,717

Int. Cl.³ H01J *7/44*

U.S. Cl. 315—65 **11 Claims**



1. A lamp circuit comprising in combination:

a clock circuit;

a multiple filament bulb operable one filament at a time;

filament failure detector means operatively connected to at least one filament of said multiple filament bulb for detecting the failure of the filament, said filament failure detector having at least one missing pulse detector circuit operatively connected between said one filament and an optical coupler circuit for detecting when a clock actuated electrical pulse driving a filament is missed; and

means to actuate another filament in said multiple filament bulb when said filament failure detector means detects failure of one filament, whereby lamp life is extended.

4,527,096

DRIVE CIRCUIT FOR CAPACITIVE ELECTROLUMINESCENT PANELS

Peter J. Kindlmann, Guilford, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Feb. 8, 1984, Ser. No. 578,236

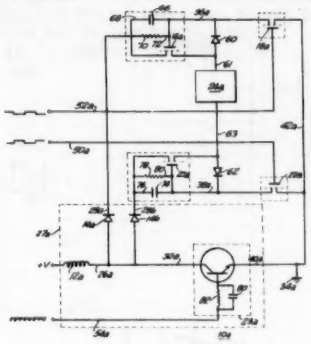
Int. Cl.³ H05B *37/00*

U.S. Cl. 315—169.3 **19 Claims**

1. In a device having a capacitive electroluminescent lamp, a battery and signal generating means for providing first signals and second signals, the improvement comprising:

a converter electrically connected to said battery, to said signal generating means, and to said capacitive electroluminescent lamp for producing current pulses, and

switching means electrically connected to said signal generating means, to said capacitive electroluminescent lamp, and to said converter and responsive to said second signals for switching a predetermined number of said current pulses to said capacitive electroluminescent lamp to produce light, and responsive to said first signals for reversing the polarity of said capacitive electroluminescent at the



end of said predetermined number of current pulses whereby the combined effects of dc battery voltage and said current pulses which pulse charge the capacitance of said electroluminescent lamp combine to enhance the light output from said capacitive electroluminescent lamp.

4,527,097

HIGH-PRESSURE SODIUM DISCHARGE LAMP

Rudolf L. A. van der Heijden, Eindhoven, and Jan W. F. Dorleijn, Roosendaal, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,802

Claims priority, application Netherlands, May 10, 1982, 8201900

Int. Cl.³ H01J *61/22, 61/30, 61/073, 41/24*

U.S. Cl. 315—246 **10 Claims**

1. A high-pressure sodium discharge lamp provided with an elongate discharge vessel which encloses a discharge vessel which encloses a discharge path and which vessel has an effective length L_e and, over at least ⅔ of the discharge path a cross-section S of constant area, in which vessel two electrodes are arranged each having an end, between which ends the discharge path extends, said lamp being operative with a power of periodically alternating value, this power comprising one or more power components sinusoidally varying with time and at least one component having a frequency ν_i for which it holds that $i-0.45 \leqq 2.35\nu_i Le/c \leqq i+0.45$, where i is an integral positive number and c is the average speed in m/s of propagation of sound waves through the gaseous part of the filling of the discharge vessel in the operative condition of the lamp, characterized in that the filling in the operative condition has a pressure P of at least 170×10^3 Pa and in that for each value of i the relation $M\nu_i f_i P{\cdot}d \leqq 185$ is satisfied, in which $M\nu_i$ is the modulation depth of the power component frequency ν_i, f_i is a geometric lamp factor and d is the mean inner diameter of the cross-section S in meters.

4,527,098

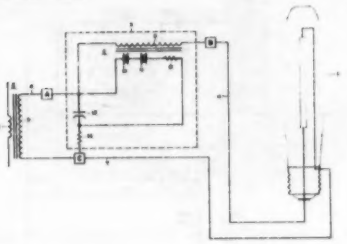
DISCRETE STARTER FOR HID LAMP

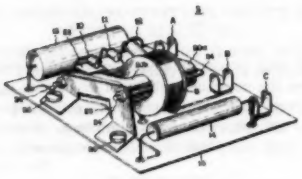
Daniel V. Owen, Hendersonville, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 28, 1983, Ser. No. 461,829

Int. Cl.[3] **H05B** *37/00, 39/00, 41/14*

U.S. Cl. 315—290 **6 Claims**





1. A discrete starter for starting a discharge lamp by high voltage pulses, said starter being of the kind comprising a pulse transformer having a secondary for connection in series with the lamp across a ballast output circuit and a primary connected in series with a voltage breakdown device across a capacitor, said capacitor and a series impedance forming a charging circuit for connection across the ballast output circuit, comprising:

a printed circuit board having three terminals and conductive strips thereon for making connections thereto,

a pulse transformer having a core of magnetic material making a closed loop fastened to said board, said transformer having on said core a secondary winding of many turns connected between a first and a second of said terminals,

a capacitor and an impedance connected in series from said first to a third of said terminals,

and a voltage breakdown device mounted transversely astride said core and connected to conductive strips in said board to form at least one primary turn around said core connected across said capacitor, the current surge through said primary turn when said device breaks down producing high voltage pulses in said secondary.

4,527,099

CONTROL CIRCUIT FOR GAS DISCHARGE LAMPS

Dennis Capewell, Easton; David G. Luchaco, Macungie, and Joel S. Spira, Coopersburg, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

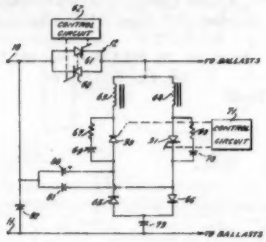
Filed Mar. 9, 1983, Ser. No. 473,799

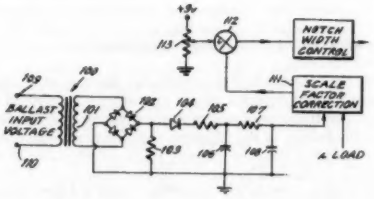
Int. Cl.[3] **G05F** *1/00;* **H05B** *37/02, 39/04, 41/36*

U.S. Cl. 315—291 **28 Claims**

1. A gas discharge lamp energizing circuit comprising inductive ballast means connectable to at least one gas discharge lamp; a source of a.c. power; series switching means connected in series with said source of a.c. power and said inductive ballast means; shunt switching means and series connected energy divertor impedance means connected in parallel with said inductive ballast means and in series with said a.c. source and said series switching means; and switching control means connected to said series switching means and to said shunt switching means to synchronously and substantially simultaneously close said series switching means and open said shunt switching means to transfer power from said source of a.c. power to said inductive ballast means, and to simultaneously open said series switching means and close said shunt switching means to produce a short duration notch in each half cycle of the voltage wave form applied to said inductive ballast means; said series connected energy divertor impedance means limiting shoot thru current flow from said a.c. source and through said series switching means in the event that both said series switching means and said shunt switching means are simultaneously closed.

23. A synchronous pulse generating circuit for producing pulses of variable width and phase location; said circuit comprising, in combination: an a.c. voltage source; a rectifier means for producing a repetitive rectified wave form of the voltage of said a.c. voltage source; a phase shift network connected to the output of said rectifier means; a standard level signal generating means; first and second comparator circuits both having positive and negative inputs; said level signal generating means connected to said positive input of said first comparator circuit and to said negative input of said second comparator circuit; the output of said rectifier connected to the negative output of said first comparator circuit whereby the output of said first comparator circuit switches when the output of said rectifier exceeds said standard level signal generating means and a pulse is initiated; the output of said phase shift network connected to said positive input of said second comparator circuit, whereby the output of said second comparator circuit switches when the output of said phase shift network becomes less than the value of the signal generated by said standard level signal generating means to terminate said pulse; said pulse being varied in length and in phase location relative to the instantaneous phase of said a.c. voltage source by changing the value of the output of said standard level signal generating means.





4,527,100
FLAT COLOR PICTURE REPRODUCTION OR VIDEO DISPLAY DEVICE

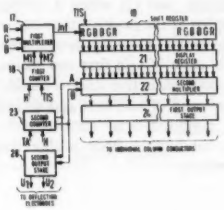
Walter Geffcken, Munich, and Burkhard Littwin, Hohenschäftlarn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 22, 1983, Ser. No. 534,589

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1982, 3235894

Int. Cl.[3] **H01J** *29/70, 29/72*

U.S. Cl. 315—366 **4 Claims**



1. Flat picture reproduction device for displaying color pictures based upon three basic colors comprising:

(a) a vacuum-tight envelope defining an interior,

(b) an electrode matrix formed of row conductors and column conductors arranged in front of the row conductors, and having cutouts at intersections thereof and subdividing the interior of the envelope into a rear and a front chamber,

(c) a planar electron source located in the rear chamber,

(d) elongated odd and even numbered vertical deflection electrodes located in the front chamber, a respective one of the deflection electrodes extending between adjacent column conductors, the odd-numbered ones of the deflection electrodes being connected to a first voltage source, and the even-numbered ones thereof to a second voltage source, and

(e) strip-shaped layers of fluorescent phosphor applied to the front inside of the envelope wall and being luminescent upon electron excitation in a respective one of the three basic colors, the layers disposed adjacent one another in a periodic color sequence the layers being parallel to the column conductors;

(f) an addressing circuit having means for scanning the row conductors sequentially, means for providing the column conductors, during a respective row scanning time interval and in the sequence of colors, with appertaining white dot information potentials in a manner that electrons supplied by the electron source can pass selectively through the cutouts formed in the electrode matrix, and means for applying steering potentials to the deflection electrodes synchronously with the color change so that the electrons entering the front chamber are directed to the respective luminescent layers having the corresponding correct color; the addressing circuit which comprises:

(g) a first multiplexer, which receives in parallel the color information for each white dot and which in response transmits serially the color information to a shift register, the color information potentials of adjacent white dots following one another;

(h) a display register for receiving the information of an entire row at the time in parallel; and

(i) a second multiplexer for receiving from said display register the three color information potentials sequentially from all of the white dot information potentials and feeding them via a first output stage to the respective individual appertaining column conductors, so that said adjacent column conductors receive said three color information potentials in alternatingly reverse sequence, the color sequence period of the luminescent layers being formed by the three basic colors.

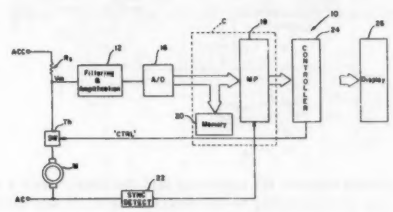
4,527,101
UNIVERSAL ELECTRIC MOTOR SPEED SENSING BY USING FOURIER TRANSFORM METHOD

Wayne Zavis, Randallstown, and David A. Saar, Timonium, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Nov. 23, 1983, Ser. No. 554,571

Int. Cl.[3] **G06F** *15/332;* **H02K** *23/64*

U.S. Cl. 318—245 **4 Claims**



1. An apparatus for sensing the operating speed of an electric motor of the type that causes recurring current variations through its windings as a function of its speed, said apparatus comprising:

impedance means for connection to an electric motor circuit for providing an electrical signal output that varies with speed-dependent variations of the current in the electric motor circuit;

converting means coupled to said impedance means for converting said electrical signal output to digital values representative of the corresponding value of the electrical signal;

stored-program controlled means coupled to said converting means for performing a Fourier transform upon said digital values to obtain an amplitude spectrum of said speed-dependent electrical signal and for identifying a maximum amplitude spectral component therein;

utilizing means connected to the output of said stored-program controlled means for utilizing the so-identified maximum amplitude spectral component as representative of the motor's speed;

filter means interposed in between said impedance means and said converting means for passing frequencies in a pass band expected for the range of motor speeds; and

said filter means comprising a plurality of cascaded switched capacitor filters.

4,527,102
DRIVE SYSTEM FOR A DC MOTOR WITH REDUCED POWER LOSS

Makoto Gotou, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 28, 1983, Ser. No. 518,284

Claims priority, application Japan, Jul. 31, 1982, 57-13401; Aug. 2, 1982, 57-135345; Aug. 2, 1982, 57-135346

Int. Cl.[3] **H02P** *6/02*

U.S. Cl. 318—254 **20 Claims**

1. A drive system for a DC motor comprising:

a permanent magnet having a plurality of N and S poles;

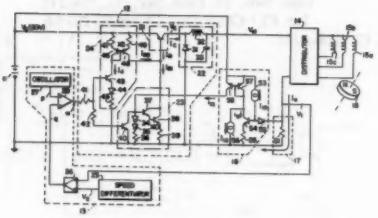
polyphase coils provided in the magnetic field of said permanent magnet so as to produce a force by interaction between magnetic flux of said permanent magnet and a current to said polyphase coils;

a DC voltage source for supplying an electrical power;

a distributor having a plurality of output transistors for distributing the electrical power of said DC voltage source to said polyphase coils, a position detector for

generating output signals corresponding to the relative position between said permanent magnet and said polyphase coils, and a selector for activating said output transistors selectively according to the output signals of said position detector;

a current detector for detecting the current to said polyphase coils; and



a current supplier for supplying said distributor with a current corresponding to the detected signal of said current detector so that the base current of said output transistor at the ON period changes corresponding to the current to said polyphase coils;

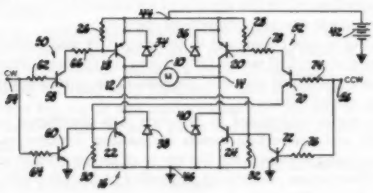
wherein the base current of said output transistor during the ON period has two parts; one part is proportional to the current to said polyphase coils, and the other part is a constant which is greater than zero.

4,527,103

FOUR STATE DC MOTOR CONTROLLER

Alexander Kade, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1984, Ser. No. 618,814
Int. Cl.[3] H02P *1/22*
U.S. Cl. 318—293 **1 Claim**



1. A drive circuit for controlling the conduction of an H-switch transistor bridge for connecting the positive and negative terminals of a DC source with the winding terminals of a DC motor in accordance with the voltage potential applied to a first and a second control terminals wherein the H-switch includes a first pair and a second pair of bridge transistors, each such pair comprising a PNP bridge transistor connecting one motor terminal to the positive terminal of said DC source and an NPN bridge transistor connecting the other motor terminal to the negative terminal of said DC source, the driver circuit comprising:

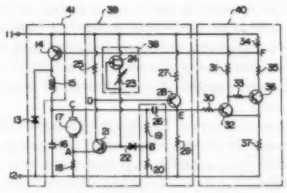
first and second pairs of NPN driver transistors connected to and controlled by said first and second control terminals respectively, one driver transistor of each such pair of driver transistors being connected to control the mutual conduction of one of said first and second pairs of brige transistors and the other driver transistor of each such pair of driver transistors being connected to hold the NPN bridge transistor of the other of said first and second pairs of bridge transistors in a nonconductive state when the one pair of bridge transistors are conductive, the first and second pairs of NPN driver transistors thereby being effective (1) when a voltage potential substantially corresponding to that at the negative terminal of said DC source is applied to both of said control terminals to render both bridge transistors of said first and second pairs of bridge transistors nonconductive to effectively disconnect the motor from the source, (2) when a voltage substantially corresponding to that at the negative terminal of said DC source is applied to one of said control terminals and a voltage determined in relation to that at the positive terminal of said DC source is applied to the other of said control terminals to effect clockwise or counterclockwise motor rotation, and (3) when a voltage determined in relation to that at the positive terminal of said DC source is applied to both control inputs to render the NPN bridge transistor of each of said first and second pairs of bridge transistors nonconductive and to render the PNP bridge transistor of each of said first and second pairs of bridge transistors conductive to short-circuit the DC motor through a conductive PNP bridge transistor to effect dynamic braking.

4,527,104

SPEED CONTROL APPARATUS FOR D.C. MOTOR

Fukashi Yoshizawa, Tatsuno, Japan, assignor to Olympus Optical Company, Ltd., Japan

Filed May 27, 1983, Ser. No. 498,845
Claims priority, application Japan, Aug. 24, 1982, 57-145510
Int. Cl.[3] G05B *5/00*
U.S. Cl. 318—331 **9 Claims**



1. A speed control apparatus for a d.c. motor, comprising:

a bridge circuit having first and second detecting terminals and first and second feed terminals, the bridge circuit comprising a d.c. motor connected between the first detecting terminal and the first feed terminal a first element connected between the first detecting terminal and the second feed terminal, a second element connected between the first feed terminal and the second detecting terminal and a third element connected between the second feed terminal and the second detecting terminal;

an error amplifier connected across the first and second detecting terminals of the bridge circuit for receiving a difference voltage across the first and second detecting terminals and for amplifying the difference voltage to provide an output signal at an output;

a Schmidt trigger circuit connected to the output of the error amplifier for receiving the output signal and for providing a trigger signal;

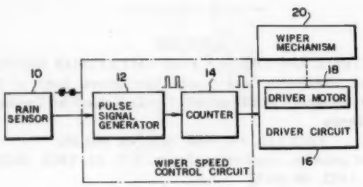
a ripple capacitor connected between the first feed terminal of the bridge circuit and the output of the error amplifier for providing ripple components to the output of the error amplifier for reducing any ripple components included in the output signal; and

a feed control circuit connected to at least one of the first and second feed terminals and responsive to the trigger signal for controlling the power supply to the d.c. motor.

4,527,105
AUTOMATIC WINDSHIELD WIPER SPEED CONTROL WITH PIEZOELECTRIC SENSOR

Yasuhiro Shiraishi, Zama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 30, 1983, Ser. No. 527,776
Claims priority, application Japan, Sep. 2, 1982, 57-151729; Sep. 2, 1982, 57-151730; Sep. 20, 1982, 57-162176
Int. Cl.³ H02P 1/04
U.S. Cl. 318—444 20 Claims



1. A control system for controlling a windshield wiper comprising:

rain sensor means for sensing the rate of rain and generating sensor signals indicative of the sensed rain rate;

means responsively connected to the rain sensor means for generating digital pulses having a frequency corresponding to the sensed rain rate in response to the sensor signals;

means responsively connected to the means for generating digital pulses for counting the digital pulses and generating a wiper control signal every time a predetermined number of the digital pulses has been counted;

a signal generator for outputting a constant-frequency digital signal to said counting means, said counting means being responsive to both the number of the digital pulses and the number of pulses in the digital signal in generating said wiper control signal; and

means responsively connected to the counting means for driving the windshield wiper through one cycle whenever the wiper control signal is generated.

2. A control system for controlling a windshield wiper comprising:

a driver motor associated with the windshield wiper for driving the windshield wiper at a variable rate;

a rain sensor including a vibrator with a sensor surface exposed to rain and vibrating in accordance with the rate of rain, said rain sensor producing a sensor signal having an amplitude which varies in accordance with the magnitude of vibration of said vibrator;

means for converting the sensor signal into a train of digital pulses having a frequency corresponding to the sensed rain rate in response to the sensor signal; and

a drive signal generator receiving the train of digital pulses and including counting means for counting the number of pulses in said train of digital pulses, generating a drive signal for driving the driver motor for one cycle of wiper operation whenever a given number of pulses are received.

4,527,106
WINDSHIELD WIPER CONTROL SYSTEM WITH IMPROVED PRECIPITATION SENSOR

Glenn N. Fischer, 7595 E. Singer Rd., Dayton, Ohio 45424

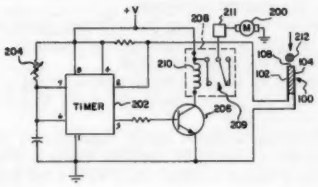
Filed Mar. 21, 1984, Ser. No. 591,716
Int. Cl.³ B60S 1/04; H01H 29/00
U.S. Cl. 318—483 22 Claims

1. A windshield wiper control system for activating the windshield wipers of a motor vehicle in response to precipitation, said control system comprising:

an improved precipitation sensing element comprising:

first and second electrode means for signaling the presence of precipitation;

electrically insulating means for separating said first and second electrode means, said electrically insulating means comprising an electrically insulating material which is impervious to said precipitation, and being formed to define a thin edge of said electrically insulating material, said first and second electrode means being secured to said electrically insulating means at opposite sides of said thin edge such that at said thin edge of said material said first and second electrodes are separated thereby and in gapless contact therewith to form a precipitation sensing edge, said electrically insulating means and said first and second electrode means being



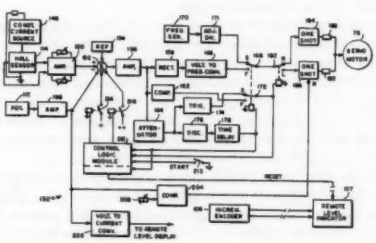
otherwise sized to make said precipitation sensing element sufficiently rigid for cantilevered support thereof to present said sensing edge for contact by said precipitation whereby said first and second eletrode means normally present a first resistance therebetween, which first resistance is substantially lowered upon impingement of precipitation on said sensing edge for a momentary period of time until said precipitation is conducted away from said sensing edge by the effects of surface tension; and

wiper control circuit means connected to said precipitation sensing means for sensing the momentary lowered resistance between said first and second electrode means to generate a windshield wiper activating signal.

4,527,107
LIQUID LEVEL MEASURING APPARATUS

Ronald van der Pol, Venlo, Netherlands, and Dieter Mertens, Duisburg, Fed. Rep. of Germany, assignors to Rheotron AG, Basel, Switzerland

Continuation-in-part of Ser. No. 511,499, Jul. 7, 1983, abandoned. This application Dec. 15, 1983, Ser. No. 561,892
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1983, 3332912
Int. Cl.³ G05D 9/00
U.S. Cl. 318—642 17 Claims



1. In liquid measuring apparatus of the type including a sensing plate suspended on a cable attached to a rotary drum connected to the shaft of a servomotor, with the shaft being rotatively connected through a spring member to the drum or the motor itself being flexibly and rotatively coupled to the

apparatus housing, a liquid level indicator coupled to the motor shaft, a sensor operative between the rotatively connected members which generates an output signal in response to a relative rotation of said members caused by changes in liquid level, and control circuitry responsive to the sensor signal for controlling the speed and direction of the motor to raise or lower the plate and thereby tend to maintain a balance of moments on the drum characterized in that the control circuitry includes

A. comparing means which receive the output signal from the sensor;

B. means for applying a reference signal to the comparing means which corresponds to the nominal balance of moments on the drum so that the comparing means produce a deflection signal reflecting the magnitude and direction of the moment imbalance;

C. means for converting the deflection signal to an alternating signal whose frequency is proportional to the magnitude of the deflection signal;

D. means for applying the alternating signal to the motor to rotate the motor selectively in the forward or reverse direction; and

E. direction selection means responsive to the deflection signal for causing the applying means to select the direction of motor rotation which moves the sensing plate so that the plate tends to assume an equilibrium position at the surface of the liquid.

4,527,108

LINEAR ACTUATOR WITH MAGNETS

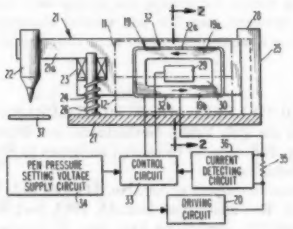
Toyoaki Enda, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,702

Claims priority, application Japan, Apr. 19, 1982, 57-65636

Int. Cl.³ G05B *11/00*

U.S. Cl. 318—687 **9 Claims**



1. A linear actuator comprising:

a first permanent magnet for creating a magnetic field in a first direction in a first space;

a second permanent magnet for creating another magnet field in a second direction, opposite to the first direction, in a second space contiguous to the first space, the relative positions of the first and second permanent magents being such that the strength of the magnetic fields created thereby is substantially zero at the boundary between the first and second spaces and changes approximately linearly at least in a region adjacent the boundary;

a driving coil having a first portion lying in the first space so as to be subjected to the action of the magnetic field due to the first permanent magnet, and a second portion lying in the second space so as to be subjected to the action of the magnetic field due to the second permanent magnet;

drive means for energizing the driving coil in order to create a linear relative motion between the first and second permanent magnets and the driving coil;

a magnetoelectric element disposed centrally within the driving coil and supported in a fixed relation thereto for generating an electric signal representative of the position of the driving coil relative to the first and second permanent magnets;

control means responsive to the output signal of the magnetoelectric element for controlling the drive means so as to cause the same to energize the driving coil in accordance with the position of the driving coil relative to the first and second permanent magnets; and

a member coupled to either of the first and second permanent magnets and the driving coil for linear motion therewith relative to the other.

4,527,109

CONTROL APPARATUS FOR THYRISTOR MOTOR

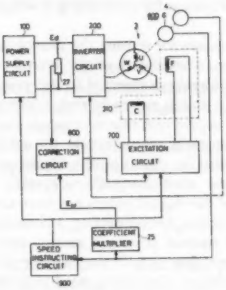
Yasuhiko Hosokawa, and Naoki Morishima, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1984, Ser. No. 580,180

Claims priority, application Japan, Feb. 22, 1983, 58-29836; Feb. 22, 1983, 58-29837

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—715 **19 Claims**



1. A control apparatus for a synchronous motor (3) including armature coils (U, V and W) and field coils (310) having a main field coil (F) for generating main field flux and a compensation field coil (C) for generating compensation field flux orthogonally intersecting with said main field flux, comprising:

power supply means (100) for supplying direct current power having a certain amount of direct current voltage (E_d),

inverter means (200) connected to said power supply means (100) and said armature coils (U, V and W) for supplying said direct current power to said armature coils (U, V and W) through commutation,

excitation circuit means (700) connected to said field coils (310) for supplying field current to said field coils (310) and for correcting said field current in response to a correction signal applied thereto,

voltage detecting means (27) connected to said power supply means (100) for detecting said direct current voltage (E_d),

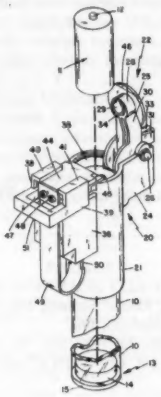
speed detecting means (600) coupled to said synchronous motor (3) for detecting the rotational speed of said synchronous motor (3) and for generating speed voltage (E_ω) of an amount having a certain functional relation with said rotational speed, and

correcting means (800) connected to said excitation circuit means (700), said voltage detecting means (27) and said speed detecting means (600) for establishing said correction signal based on a difference between said detected direct current voltage (E_d) and said speed voltage (E_ω) and for applying said correction signal to said excitation circuit means (700).

4,527,110
CHARGER FOR BATTERIES

George W. McCarty, Lutherville, and Somers H. Smith, III, Columbia, both of Md., assignors to Solid State Chargers Research & Development, Lutherville, Md.

Filed Apr. 10, 1984, Ser. No. 598,580
Int. Cl.[3] H01M 2/10, 10/46
U.S. Cl. 320—2 40 Claims

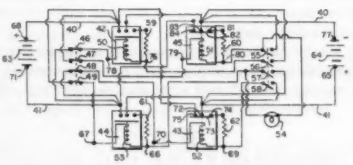


1. In a charger for batteries, the combination of a housing including a hollow member having an open end through which batteries to be charged are to be inserted end-to-end, constant-tension spring means within said housing for urging the batteries outwardly of said housing via said open end, a movable cover positioned adjacent to said open end of said hollow member, means for movably supporting said cover on said housing, a pair of spaced-apart contact prongs, at least one of which is carried by said movable cover, thereby preventing electrical connection to said prongs wherever said cover is moved away from said open end of said hollow member, latching means for retaining said cover in a closed orientation, and retaining means cooperating with said latching means for retaining the batteries in said tubular member whenever said cover is moved away from said open end of said tubular member.

4,527,111
SAFETY JUMPER CABLES

Tillman W. Branham, Johnson City, Tenn., assignor to Joseph N. Connell, Columbia, S.C.

Filed Apr. 12, 1984, Ser. No. 600,347
Int. Cl.[3] H01M 10/46
U.S. Cl. 320—26 1 Claim



1. A battery jumper cable assembly having a pair of battery jumper cables for automatically connecting two storage batteries in a parallel relationship after cable clamps attached to the ends of each of the pair of first and second battery jumper cables have been connected, one cable clamp from each of said battery jumper cables to each of said storage batteries, comprising, in combination:

four normally open single pole, single throw solenoid switches,

one of said solenoid switches connected in series with said first battery jumper cable, one of said solenoid switches connected in series with said second battery jumper cable, and the remaining two of said solenoid switches connected in series with both said first and said second battery jumper cables; and

a gang of four normally closed release switches, two of said release switches each being connected in series between said first battery jumper cable, upstream of said solenoid switches, and a separate one of the coils of said solenoid switches, and the other two of said release switches each being connected in series between said second battery jumper cable, upstream of said solenoid switches, and a separate one of the coils of said solenoid switches; and

a gang of four normally open actuating switches, two of said actuating switches each being connected in series between said first battery jumper cable, downstream of said solenoid switches, and a separate one of said coils of said solenoid switches, and the other two of said actuating switches each being connected in series between said second battery jumper cable, downstream of said solenoid switches, and a separate one of said coils of said solenoid switches; and

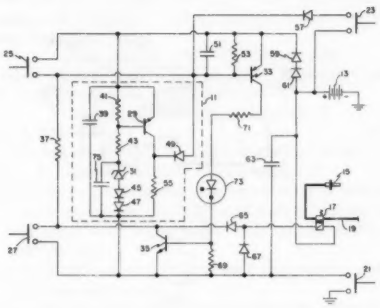
four dropping resistors, each of said dropping resistors separately connected at one end to a normally open contact of one of said solenoid switches, and the other end of said dropping resistor connected to the coil of the associated solenoid switch, upstream from said normally open actuating switch;

whereby when said ganged activating switches are pressed momentarily closed, two of the normally open solenoid switches will close, interconnecting directly the two storage batteries in a parallel relationship, providing continuity of current in both battery jumper cables, and current will pass through the dropping resistors associated with the two activated closed solenoid switches to thereby latch said closed solenoid switches, holding each of said activated solenoid switches in a closed position, after said ganged activating switches are no longer depressed.

4,527,112
ENGINE SPEED CONTROL CIRCUIT FOR EMERGENCY VEHICLE

Charles A. Herman, 7518 Gathings Dr., Fort Wayne, Ind. 46816

Filed Dec. 14, 1983, Ser. No. 561,536
Int. Cl.[3] H02J 7/32
U.S. Cl. 320—61 22 Claims



1. A control circuit for a vehicle electrical system of the type where the vehicle engine functions as a prime mover of a voltage regulated electrical source with that source in turn supplying current to meet the electrical requirements of the

vehicle including vehicle storage battery charging current comprising;

means for selectively maintaining a vehicle engine throttle at an engine speed setting above normal engine idle;

means for monitoring vehicle storage battery voltage;

means responsive to an indication by the monitoring means that battery voltage is less than a predetermined threshold for enabling the means for selectively maintaining thereby driving the electrical source at a higher speed and correspondingly higher output than the speed and output corresponding to engine idle, including latching circuitry whereby once enabled the engine speed remains above normal idle even though battery voltage rises above the predetermined threshold; and

means responsive to vehicle driver intervention for disabling the latching circuitry to allow engine speed to return to normal idle comprising a switch actuated by movement of a vehicle transmission control lever for disabling the latching circuitry when the vehicle transmission is in other than a neutral state.

19. A control circuit for a vehicle electrical system of the type where the vehicle engine functions as a prime mover of a voltage regulated electrical source with that source in turn supplying current to meet the electrical requirements of the vehicle including vehicle storage battery charging current comprising;

means for selectively maintaining a vehicle engine throttle at an engine speed setting above normal engine idle;

solid state control circuitry for enabling the means for selectively maintaining thereby driving the electrical source at a higher speed and correspondingly higher output than the speed and output corresponding to engine idle; and

means responsive to vehicle driver intervention for disabling the solid state control circuitry returning engine speed to normal idle comprising a vehicle brake light actuating switch connected to disable the solid state control circuitry when the brake lights are energized, and a switch actuated by movement of a vehicle transmission control lever for disabling the solid state control circuitry when the vehicle transmission is in other than a neutral state.

4,527,113

METHOD FOR MEASURING IMPULSE DELAYS AND FAULT LOCATIONS IN CABLES AND LIGHT WAVE CONDUCTORS

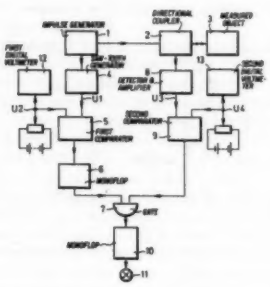
Bernd Hillerich, Ulm, Fed. Rep. of Germany, assignor to Philips Kommunikations Industrie AG, Fed. Rep. of Germany

Filed Mar. 9, 1982, Ser. No. 356,479

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115200

Int. Cl.[3] **G01R** *27/04, 31/08*

U.S. Cl. 324—52 **3 Claims**



1. A method for measuring impulse delays and fault locations in conductors, including a generator (**1**) for generating impulses which are fed into the measured object through a directional coupler (**2**) which also separates the impulses reflected back from the measured object to a detector, and a saw-tooth generator (**4**) for generating a saw-tooth signal upon the receipt of each impulse from said generator, comprising the steps of:

comparing the amplitude of said saw-tooth signal to a predetermined adjustable first direct current voltage (U2) and generating a first impulse signal when said amplitude exceeds said first direct current voltage;

comparing the output voltage from said detector to a predetermined adjustable second direct current voltage (U4) and generating a second impulse signal when the output voltage of said detector exceeds said second direct current voltage;

detecting the time coincidence of said first and second impulse signals and producing a third impulse signal when said first and second impulse signal coincide in time; and

displaying said time coincidence of said first and second impulse signals, whereby said time coincidence corresponds to the impulse delay and the fault location of said conductor.

4,527,114

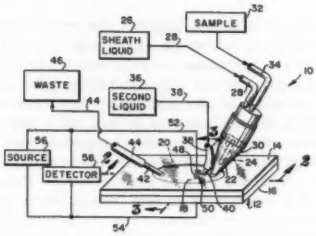
ELECTRICAL SLIT SCANNING APPARATUS

Wallace H. Coulter, Miami Springs, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Feb. 25, 1982, Ser. No. 352,438

Int. Cl.[3] **G01N** *27/00*

U.S. Cl. 324—71.1 **7 Claims**



1. A particle analyzer apparatus including resistive impedance sensing comprising:

first means for providing a flow of a liquid suspension of an electrolyte, said suspension having individual particles entrained therein, said first means forcing said flow to be along a predetermined path;

energizing means, for generating an electric field, including a pair of electrodes disposed on opposed sides of said predetermined path, one of said electrodes having an end with a width parallel to said predetermined path that is less than the length of a given particle for forming a very narrow electrical field, said end of said electrode being positioned in close proximity to said predetermined path so that each particle will flow through said very narrow electrical field; and

second means, electrically coupled to said energizing means, for impedance detecting particle pulses caused by particles passing through said very narrow electrical field.

4,527,115

CONFIGURABLE LOGIC GATE ARRAY

Deepak Mehrotra; Rajni Kant, both of Milpitas, and Kishor M. Patel, San Jose, all of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 22, 1982, Ser. No. 452,169

Int. Cl.[3] **G01R** *15/12*

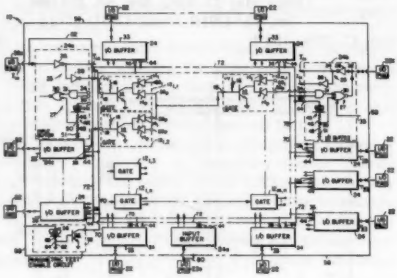
U.S. Cl. 324—73 R **3 Claims**

1. An integrated circuit comprising:

(a) a plurality of logic gates adapted for electrical intercon-

nection to provide a predetermined logic function relating the logic states of a plurality of input logic signals to a logic output signal produced at an output terminal; and,

(b) parametric testing circuit means responsive to a control signal for electrically coupling, during a normal operating mode, the logic output signal of the interconnected gates



produced at the output terminal to an output pad, or, for, during a parametric testing mode, electrically decoupling the output terminal from the output pad, while electrically coupling to the output pad a parametric signal source, such source producing "high" and "low" output voltages representative of logic output voltages produced by the logic gates in response to the input logic signals.

4,527,116

PROCESS AND DEVICE FOR SYSTEM CHARACTERIZATION BY SPECTRAL ANALYSIS

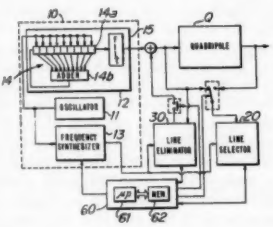
Antoine Sorba, Le Mesnil Saint-Denis; Gérard J. Attal, Fresne; Georges B. Seignier, Montrouge, all of France, and Ahmed M. Hamad, El Agouza, Egypt, assignors to Ecole Superieure d'Electricite and Enertec, France

Filed Jun. 29, 1982, Ser. No. 393,415

Claims priority, application France, Jun. 30, 1981, 81 12872

Int. Cl.³ G01R *23/16*

U.S. Cl. 324—77 B **10 Claims**



1. A method for determining transfer characteristics of a system by spectral analysis, said system having a signal input and a signal output, said method comprising the steps of

generating a pseudo-random measuring signal having a spectrum constituted by lines of predetermined frequencies spaced apart from one another,

applying the measuring signal to said signal input terminal of said system,

performing at least one first measurement step comprising the steps of selecting one of said lines of the spectrum of the measuring signal, generating a detection signal having a frequency equal to the frequency of the selected line, and making a comparison in phase and amplitude between the signal input and a signal output of the system by synchronous detection by means of the detection signal, and performing at least a second measurement step comprising the steps of selecting a line to be eliminated among said lines of the spectrum of the measuring signal, generating an elimination signal having the same frequency and amplitude as said line to be eliminated but having opposite phase, superposing said elimination signal to the measuring signal at the signal input to the system, and measuring the phase or amplitude or both at said signal output.

4,527,117

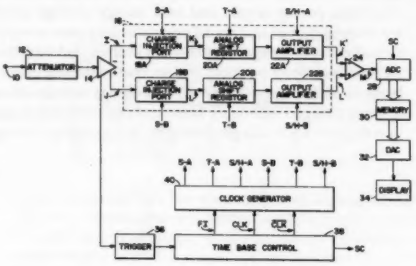
SIGNAL PROCESSING SYSTEM EMPLOYING CHARGE TRANSFER DEVICES

David W. Morgan, Gaston, and Roland E. Andrews, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 18, 1982, Ser. No. 434,976

Int. Cl.³ G01R *13/20;* **H03K** *21/00*

U.S. Cl. 324—121 R **9 Claims**



1. A signal processing system, comprising:

first and second charge transfer devices for receiving a push-pull signal;

a clock generator for generating clock pulses to be applied to said first and second charge transfer devices, the clock pulse for said first charge transfer device being shifted one-half clock cycle with respect to the clock pulse for said second charge transfer device so that the sampling rate of the push-pull signal is twice the clock frequency; and

a differential amplifier for differentially summing the signals from said first and second charge devices.

4,527,118

TESTING DEVICE FOR INDICATING AN ELECTRIC VOLTAGE AND ITS POLARITY AND FOR CONTINUITY TESTING

Manfred Koslar, Rheda-Wiedenbrück, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,801

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1981, 3125552; Apr. 14, 1982, 3213749

Int. Cl.³ G01R *13/02, 19/14, 15/12*

U.S. Cl. 324—133 **9 Claims**

1. Testing device for indicating an electric voltage and its polarity and for continuity testing, comprising:

a first and a second handle for accomodating circuits therein, a cable connected between said handles, first and second test prods each being respectively connected to one of said handles;

two high-resistance series resistors being connected in series with said test prods;

indicating stages having optical indicating elements with staggered voltage ranges disposed in one of said handles;

an oscillator connected to said indicating stages;

an acoustical signal generator being connected to and selectively drivable by said oscillator;

an isolation amplifier connected between said indicating

stages and said high-resistance series resistors for amplifying input current being limited by said high-resistance series resistors;

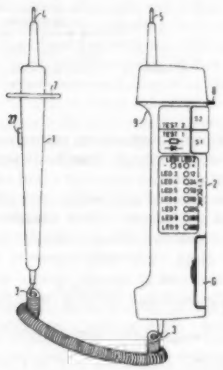
a battery being connected to said isolation amplifier and being connectible into the testing device by said isolation amplifier to bring about a staggered indication of voltage to be tested, to selectively indicate polarity of the voltage to be tested and to switch on said acoustical signal generator;

a switching power supply being connected to and fed by said oscillator for increasing voltage of said oscillator limited by said battery;

an energy storage device connected to an input of said isolation amplifier for storing a charge and delivering it to said isolation amplifier;

a first switching element connected to said battery:

a second switching element being connected between said switching power supply and said energy storage device for feeding output voltage of said switching power supply to said energy storage device when said second switching element is in a rest position, said second switching element being in said rest position when said energy storage device is being charged and being switchable into a contact position for feeding a charge contained in said energy storage



device to said input of said isolation amplifier and for automatically checking operability of indicating functions of the testing device in sequence;

transistors having bases connected to said oscillator for intermittently switching on or chopping indicating current for a first group of said optical indicating elements for a given relatively brief time for voltages to be tested in given relatively higher voltage ranges and for a second group of said optical indicating elements for voltages to be tested in given relatively lower voltage ranges;

a Zener diode connected between one of said high-resistance series resistors connected to said second test prod and said first switching element connected to said battery;

said first switching element being switchable into a rest position for shorting said Zener diode and into a contact position for switching on said battery; in said contact position of said first switching element the continuity test being performed through a conductor inserted between said test prods and an internal test being performed if direct contact is made between said test prods for operability of said battery, said acoustical signal generator, at least one of said optical indicating elements for the polarity indication, and at least one other of said optical indicating elements depending on voltage of said battery and charging of said energy storage device.

4,527,119

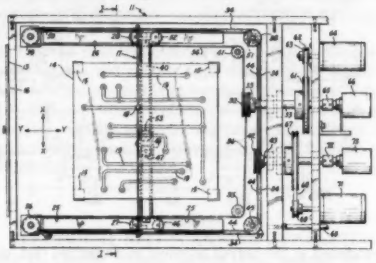
HIGH SPEED, LOW MASS, MOVABLE PROBE AND/OR INSTRUMENT POSITIONER, TOOL AND LIKE ITEMS SUITABLE FOR USE IN A CONTROLLED ENVIRONMENT CHAMBER

David P. Rogers, and Donald J. Geisel, both of Clifton Park, N.Y., assignors to Testamatic, Incorporated, Latham, N.Y.

Filed May 17, 1982, Ser. No. 379,004

Int. Cl.[3] **G01R** *31/02;* **G01D** *15/16*

U.S. Cl. 324—158 F **9 Claims**



1. A high speed, low mass positioning apparatus for positioning a test probe at any desired point within an x-y plane comprising a first axis of movement means for positioning the probe along one axis of movement and a second axis of movement means for positioning the probe along the remaining transverse axis of movement, both of said axis of movement means comprising motor driven pulley wheel and drive cable arrangements arrayed around the outer periphery of the x-y planar area within which it is desired to position the test probe, one of said axis of movement means being arranged to move a set of spaced-apart movable trucks in either direction along two spaced-apart parallel boundaries defining the opposite side of the x-y planar area, a light inflexible track member secured between and carried by said two spaced-apart movable trucks and movable therewith in either direction along said one axis of movement, a small lightweight movable carrier movably supported by said track member and movable therealong in either direction transverse to said one axis of movement, the other of said axis of movement means being arranged to move said small lightweight movable carrier back and forth in either direction along the second axis of movement on said track member, a respective pulley wheel mounted on each of said movable trucks and movable therewith, said truck mounted pulley wheels supporting a movable conductive fine wire endless loop therebetween which extends along the same axial direction as the track member, one side of the movable fine wire loop being secured to and moved by the small lightweight movable carrier, means for electrically insulating said conductive fine wire endless loop from the truck mounted pulley wheels and said movable carrier, and an electrically conductive test probe secured to and movable with the other side of the movable conductive fine wire loop whereby the electrical test probe can be positioned at any desired point within the planar x-y area.

4,527,120

SYSTEM FOR CONVERTING MECHANICAL MOVEMENT TO A DIGITAL SIGNAL

Ryoichi Kurosawa, Hachioji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 285,969, Jul. 23, 1981, abandoned. This application Sep. 8, 1983, Ser. No. 529,935

Claims priority, application Japan, Aug. 6, 1980, 55-108003

Int. Cl.[3] **H03K** *13/02;* **G05B** *1/03*

U.S. Cl. 324—166 **4 Claims**

1. A system for converting mechanical movement of a body under detection to a digital signal comprising:

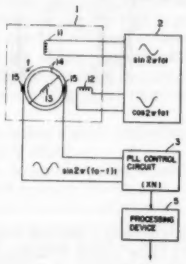
a synchro generator having a plurality of primary windings

and at least one secondary winding, said primary windings and said secondary winding being movable relative to each other, one of said secondary winding and said plurality of primary windings being capable of being coupled to said body,

an exciting circuit for providing multiple-phase exciting currents to said primary windings at a frequency higher than the frequency corresponding to the maximum speed of said body, and

a phase-locked-loop control circuit responsive to the output of said secondary winding for generating a frequency-multiplied digital signal at a frequency equal to the product of the frequency of an AC signal induced in said secondary winding and a predetermined factor,

said phase-locked-loop control circuit comprising a voltage-to-frequency converter, a frequency-divider circuit adapted to receive the output of said voltage-to-frequency converter, phase comparing means, adapted to receive said AC signal from said secondary winding and the output of said frequency-divider circuit for producing a phase-difference signal indicative of the phase difference



between said AC signal from said secondary winding and said output of said frequency-divider circuit, wherein said phase-locked-loop control circuit further comprises a loop filter which receives the output of said phase comparing means and produces a DC signal indicative of the average value of the phase difference, said voltage-to-frequency converter being responsive to the output of said loop filter, and controlled to produce said frequency-multiplied signal,

said system further comprising counter means, for counting the number of cycles of said frequency-multiplied signal, said counter means having a full scale equal to said predetermined factor,

sampling means for sampling the count value of said counter means at an interval equal to a multiple of the period of said exciting current,

said counter means being adapted to reset immediately after the count value is sampled, and

said sampling means providing a signal indicative of the sampled count value which represents the speed of said body.

4,527,121

SHORT-CIRCUIT-PROTECTED EVALUATION CIRCUIT OF HIGH STABILITY FOR VARIABLE INDUCTANCE TRANSDUCERS

Werner Fischer, Ditzingen; Ulrich Flaig, Markgröningen; Gerhard Hettich, Esslingen, and Johannes Locher, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 11, 1982, Ser. No. 377,023

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119162

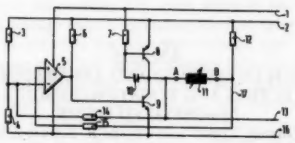
Int. Cl.³ G01B *7/14;* G01N *27/00*

U.S. Cl. 324—207 **10 Claims**

1. An electric circuit for a variable inductor of an inductive transducer for measuring mechanical displacement, said circuit comprising, in combination with first and second voltage supply lines, said first voltage supply line being at a higher potential than said second voltage supply line:

an amplifier (5);

a final stage including a delay network comprising said inductor (11) and a first resistance (12) connected between a first terminal (B) of said inductor and said second voltage supply line (2), said final stage also including a first transistor (9) having one of its two switching path electrodes grounded and its other switching path electrode connected to a second terminal (A) of said inductor, and having its base connected to the output of said amplifier, said switching path electrodes being the emitter and collector of said first transistor, said delay network having a feedback connection output (17, 15; 25) connected between said first terminal (B) of said inductor and an input



of said amplifier (5) for producing and timing the cycle period of oscillations of a system including said amplifier (5) and said final stage, said oscillations producing an output signal available at said second terminal (A) of said inductor; and

a second transistor (8) having its base electrode connected to said first voltage supply line (1) through a second resistance (7) and having its collector-emitter path interposed between said second voltage supply line (2) and said second terminal (A) of said inductor in such a sense that said second transistor (8) conducts when said first transistor (9) is blocked and said second transistor is automatically blocked when said second terminal (A) of said inductor is at a potential near ground potential, the voltage difference between the respective voltages of said first and second voltage supply line being limited to the maximum permissible base to emitter voltage of said second transistor (8).

4,527,122

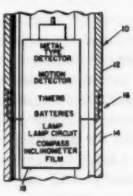
BORE HOLE DIRECTION MEASURING INSTRUMENT CONTROL

Lawrence A. Pyatt, 260 Princess Ann Ct., Henderson, Nev. 89015, and Robert W. Thompson, 5210 Ensley Dr., Riverside, Calif. 92505

Division of Ser. No. 119,171, Feb. 6, 1980, Pat. No. 4,365,197, which is a continuation-in-part of Ser. No. 892,284, Mar. 31, 1978, abandoned. This application Jun. 11, 1982, Ser. No. 387,598

Int. Cl.³ G01N *27/82;* G03B *37/00;* G01D *9/42;* G01R *33/00*

U.S. Cl. 324—226 **2 Claims**



2. The method of controlling operation of photograph taking in a well bore to ensure that the subject of the photograph is in a substantially non-magnetic environment at the time of taking the photograph, which method comprises the steps of:

(a) lowering photographic equipment and a photographic subject into the well with means for determining whether said photographic subject is in a magnetic or substantially non-magnetic environment;

(b) determining with the aid of said means when said photographic subject is in a non-magnetic environment;

(c) operating said photographic equipment to photograph said subject when the subject is in a non-magnetic environment; and

(d) determining whether the environment is magnetic or non-magnetic being accomplished by observing the effect of said environment on a magnetic field which alternates at a frequency between 200 and 800 Hz.

4,527,123

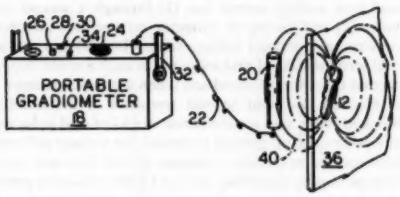
IMPROVED METHOD AND APPARATUS FOR DETECTING AND LOCATING RESIDUALLY MAGNETIZED ITEMS

Robert F. Gilman, Cotati, and Claude R. Schwarz, Santa Rosa, both of Calif., assignors to Sentronic of California Incorporated, Rohnert Park, Calif.

Filed Jul. 8, 1980, Ser. No. 166,840

Int. Cl.³ G01R *33/022, 33/04*

U.S. Cl. 324—254 **7 Claims**



1. Portable apparatus for detecting and locating residually magnetized items in preference to similar non-magnetized items, comprising:

a hand held probe including:

a plurality of axially spaced apart transformer means, each transformer means having a primary and a secondary wound about a separate core having high permeability characteristics, each primary connected in series with another thereof, and each said transformer means aligned in proximity with another thereof, as to develop a common magnetic field upon excitation of the primary windings thereof, each secondary thereof connected in series in polar opposition,

driving generator means connected to said primaries for generating a limited duty cycle, audio frequency drive current and passing it through each said primary, said drive current being of sufficient magnitude to cause each core to saturate before peak drive current is reached and to develop said common magnetic field,

harmonic audio frequency energy detector means connected to said secondaries for detecting changes in amplitude of harmonics of said drive current induced as voltage pulses in one or another of said secondaries when said field becomes unbalanced by the presence of a weak residual magnetic field emanating from a said residually magnetized item and for reproducing as proportional sound signals said detected changes to provide a relative indication of direction and proximity of said item.

4,527,124

METHOD OF AND DEVICE FOR DETERMINING A NUCLEAR MAGNETIZATION DISTRIBUTION IN A PART OF A BODY

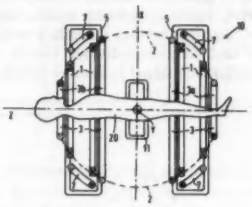
Cornelis M. J. van Uijen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1982, Ser. No. 447,841

Claims priority, application Netherlands, Sep. 10, 1982, 8203519

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **12 Claims**

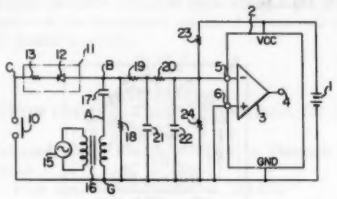


1. A method of determining a nuclear magnetization distribution in a part of a body which is situated in a stationary, homogeneous magnetic field which is generated in a first direction, (a) a high-frequency electromagnetic pulse being generated whose magnetic field direction extends perpendicularly to the field direction of the homogeneous magnetic field in order to cause a precessional motion of the magnetization of nuclei in the body around the first field direction, a resonance signal thus being generated; (b) after which either a first or a first and a second gradient magnetic field is applied during a preparation period, the gradient directions thereof being perpendicular to one another and the field directions being coincident with the first direction; (c) after which a further gradient field is applied for a measuring period, the gradient direction thereof being perpendicular to the gradient direction of at least one of the gradient magnetic fields mentioned sub (b), the field direction being coincident with the first direction, the measuring period being divided into a number of equally large sampling intervals for the periodic extraction of a number of (n) sampled signals from the resonance signal (FID-signal); (d) after which, each time after a waiting period, the steps (a), (b) and (c) are repeated a number of times (n'), the integral of the intensity of at least one gradient field over the preparation period each time having a different value in order to obtain a group of sampled signals wherefrom, after Fourier transformation thereof, an image of the distribution of the induced nuclear magnetization is determined, characterized in that during the measuring period an additional gradient magnetic field is generated whose gradient direction corresponds to the gradient direction of a gradient magnetic field generated during the preparation period and whose field direction coincides with the first direction, the additional gradient magnetic field being periodic in time and having a period which is equal to the sampling interval, the effect exerted on the nuclear magnetization by the additional gradient magnetic field integrated over a sampling interval being zero, at least one additional sampling operation being performed after the beginning and before the end of each sampling interval.

4,527,125
FLAME DETECTING APPARATUS

Motoshi Miyanaka; Kenzi Toudo, and Toshiaki Sagawa, all of Yanai, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1982, Ser. No. 435,553
Claims priority, application Japan, Nov. 13, 1981, 56-181129; Mar. 15, 1982, 57-39539
Int. Cl.³ G01M *27/00*; G06G *7/12*
U.S. Cl. 328—6 **14 Claims**



1. A flame detecting apparatus, comprising:

a voltage comparison circuit which produces an output signal of high level in response to operation of a pressure switch indicative of the presence of flame, said voltage comparison circuit having a negative offset voltage and having a non-inverting input terminal connected to the ground;

a first circuit including a diode and a first resistor connected in series to each other;

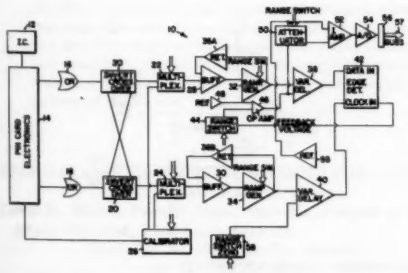
said first circuit being connected to said pressure switch to form with said pressure switch a second circuit;

wherein said second circuit, an impedance circuit and an AC voltage source are sequentially connected to one another so that an AC current flows to said first circuit from said AC voltage source in response to operation of said pressure switch indicating the presence of flame, said impedance circuit having an output terminal connected to an inverting input terminal of said voltage comparison circuit through a smoothing circuit and a bias circuit.

4,527,126
AC PARAMETRIC CIRCUIT HAVING ADJUSTABLE DELAY LOCK LOOP

Dennis M. Petrich, Mound, and Jan B. Wilstrup, Shoreview, both of Minn., assignors to Micro Component Technology, Inc., Shoreview, Minn.

Filed Aug. 26, 1983, Ser. No. 526,551
Int. Cl.³ H03K *5/153*
U.S. Cl. 328—155 **16 Claims**



1. A delay lock loop including first time delay means having an input connected to a first pulse train source, which source is a first pin of an electronic device, and having an output connected to and providing a first pulse train to a first input means of a pulse edge detector means having first and second input means, the pulse edge detector means producing an analog output signal related to the time interval of between an edge transition of a pulse on the first input means and a pulse on the second input means, second time delay means having an input connected to a second pulse train source which pulse train source is a second pin of said electronic device and having an output connected to and providing a second pulse train to the second input means of the pulse edge detector means and having feedback means for providing the output signal related to the time interval to the second time delay means to provide an input thereto to control the time delay of the second pulse train, wherein the improvement comprises:

first ramp generator means coupled between the first pulse train source and the first time delay means for generating a highly linear voltage ramp commencing at a reference voltage in response to a transition of a pulse edge of the first pulse train;

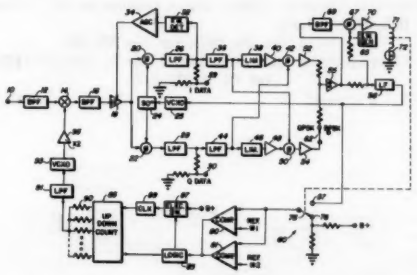
first retrace means connected to the first ramp generator means for terminating the ramp when it has attained a certain voltage and commanding the first ramp generator means to return to the reference voltage; and

second ramp generator means coupled between the second pulse train source and the second time delay means for generating a highly linear voltage ramp commencing at a reference voltage in response to a transition of a pulse edge of the second pulse train, second retrace means connected to the second ramp generation means for terminating the second ramp when it has attained a certain voltage and commanding the second ramp generator means to return to the reference voltage.

4,527,127
FREQUENCY ACQUISITION CIRCUIT FOR PHASE LOCKED LOOP

Kenneth H. Brown, Clarkdale, Ariz., assignor to Motorola Inc., Schaunburg, Ill.

Filed Jun. 30, 1982, Ser. No. 394,022
Int. Cl.³ H03D *3/00*
U.S. Cl. 329—122 **7 Claims**



1. In conjunction with a phase locked loop including an input, a controllable oscillator, and loop control circuitry, a frequency acquisition sensitive circuit comprising:

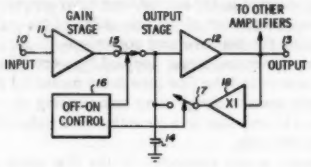
a second controllable oscillator coupled to the input of the phase locked loop for altering the frequency of input signals to the phase locked loop; and

means coupled to the loop control circuitry and to said second controllable oscillator for controlling said second controllable oscillator to reduce the frequency difference between the input signals to the phase locked loop and the frequency of the controllable oscillator in the phase locked loop when the frequency difference exceeds a predetermined amount and for maintaining said second controllable oscillator at a constant frequency when the frequency difference is below the predetermined value.

4,527,128
BISTATE LINEAR AMPLIFIER CIRCUIT

Harry J. Bittner; Daniel D. Culmer, both of Santa Clara, and Walter R. Davis, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 6, 1983, Ser. No. 529,430
Int. Cl.[3] H03F 1/02
U.S. Cl. 330—9 6 Claims



1. A linear amplifier output stage circuit, adapted for coupling to a load element in common with one or more additional amplifiers, said output stage having input and output terminals and at least one output transistor connected to produce an amplified output signal at said output terminal in response to a signal at said input terminal, said circuit comprising:

means for providing operating bias current for said output transistor;

means for turning said operating bias current on and off in response to a control signal;

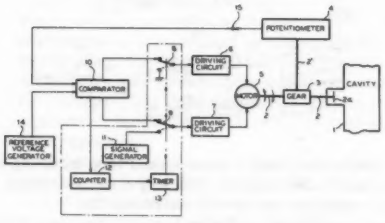
unity gain buffer amplifier means having an input coupled to said output terminal and an output coupled to said output stage input terminal; and

means for turning said buffer amplifier means on and off in complementary fashion with said operating bias current.

4,527,129
KLYSTRON TUNING CONTROL SYSTEM

Yoshiyuki Takeyasu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 28, 1983, Ser. No. 555,369
Claims priority, application Japan, Dec. 8, 1982, 57-215922
Int. Cl.[3] H03F 3/56
U.S. Cl. 330—45 6 Claims

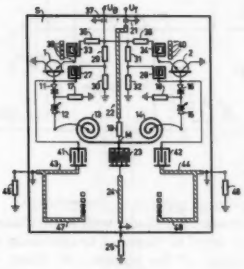


3. A klystron tuning control system comprising a cavity having a plunger mounted therein for reciprocal mechanical movement in order to tune said cavity, means for mechanically moving said plunger with backlash in either of two directions responsive to a tuning selection command, and means responsive to an end of said mechanical movement for adding an incremental movement in only a predetermined one of said two directions whereby said movement always ends with an incremental movement in one direction, said incremental movement exceeding the backlash of plunger movement.

4,527,130
PUSH-PULL MICROWAVE OSCILLATOR WITH FUNDAMENTAL AND SECOND HARMONIC OUTPUTS

Georg Lütteke, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1982, Ser. No. 416,753
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1981, 3136348
Int. Cl.[3] H03L 7/00; H03B 25/00, 5/18; H03K 3/26
U.S. Cl. 331—36 C 7 Claims



1. A push-pull microwave oscillator circuit including first and second transistors for producing the second harmonic of a fundamental frequency at a symmetry point of the circuit which is connected to the bases of the transistors through first and second identical arrangements of circuit elements, said circuit including:

(a) tuning means coupled to at least one of the transistors;

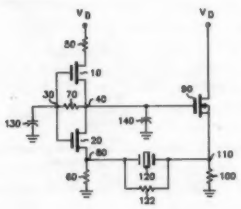
(b) an output, coupled to the base of at least one of the transistors by a capacitive impedance, for providing to a phase comparison means an output signal at the fundamental of the second harmonic frequency produced at the symmetry point; and

(c) an input, coupled to said tuning means, for receiving a tuning signal produced by the phase comparison means in response to said output signal.

4,527,131
OSCILLATING CIRCUIT EXHIBITING TOLERANCE TO CRYSTAL IMPEDANCE VARIATIONS

Barry W. Herold, Lauderhill, and Walter L. Davis, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1983, Ser. No. 564,597
Int. Cl.[3] H03B 5/36
U.S. Cl. 331—116 FE 4 Claims



1. An oscillator circuit comprising:

complementary MOS transistor amplifier means, having an input and an output and including first and second MOS transistors coupled together in a non-inverting complementary configuration, for amplifying signals provided thereto in a non-inverting manner;

MOS transistor source follower means, having a high impe-

dance input and a low impedance output, the input of said source follower means being coupled to the output of said amplifier means, and

piezoelectric feedback means, coupled between the output of said source follower means and the input of said amplifier means, for providing feedback at a predetermined frequency from said source follower means to said amplifier means to cause said oscillator to oscillate at said predetermined frequency,

whereby, said oscillator circuit is made to exhibit tolerance to variation in the impedance exhibited across said piezoelectric feedback means.

4,527,132

DEVICE FOR EVOLUTIVE ILLUMINATION OF AN OBJECT

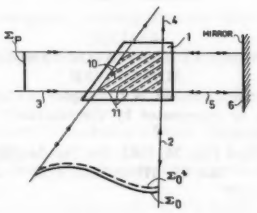
Jean P. Huignard, Paris, France, assignor to Thomson CSF, Paris, France

Filed Jun. 28, 1982, Ser. No. 392,474

Claims priority, application France, Jun. 30, 1981, 81 12833

Int. Cl.³ H01S *3/10*; H04N *5/30*

U.S. Cl. 332—7.51 **10 Claims**



1. A device for evolutive illumination of an object by laser radiation comprising:

an illumination laser whose cavity is closed by two totally refractive mirrors,

a photoexcitable interaction medium with index variation disposed inside the said cavity in the path of the intra-cavity radiation, and

means for transitorily illuminating the object by said laser radiation so that the object reflects a transitory signal wave towards said medium, said intra-cavity radiation interfering within said medium with said transitory signal wave so that the interaction medium generates a complex conjugate signal wave reflected towards said object, said conjugate wave returning to the object and being reflected thereby forming a new signal wave having a front whose complex shape depends on the reflecting structure of the object and on the unhomogeneous distribution of the refractive index in the transmission medium separating said laser from said object to provide consecutively evolutive and then maintained illumination of said object from said transitory signal wave, the illumination continuing whatever the disturbance in the transmission medium or motion of the object.

4,527,133

SELF-BALANCING CURRENT SOURCES FOR A DELTA MODULATOR

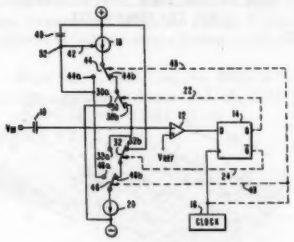
David K. Money, Pennant Hills, Australia, assignor to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Jun. 30, 1982, Ser. No. 393,800

Int. Cl.³ H03K *13/22*

U.S. Cl. 332—11 D **14 Claims**

1. A delta modulator for operating on a sensed signal comprising capacitor means, means for applying said sensed signal to one side of said capacitor means, a first constant current source for charging said capacitor means, a second constant current source for discharging said capacitor means, means for comparing the potential on the other side of said capacitor means with a reference potential to periodically derive a bit sample the state of which represents the result of the most recent comparison, means for coupling either said charging constant current source or said discharging constant current source to said capacitor means in accordance with the state of each bit sample to control the potential across said capacitor



means to track the potential of said sensed signal, only one of said constant current sources being coupled to said capacitor means at any instant of time, means for periodically developing a control signal whose amplitude is a function of the relative magnitudes of said two constant current sources, and feedback means for utilizing said control signal to control the amplitude of at least one of said constant current sources to equalize the magnitudes thereof.

4,527,134

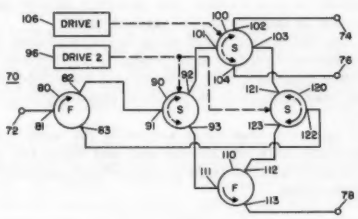
RECIPROCAL RF SWITCH

Ernest Wantuch, Fort Lee, N.J., assignor to Premier Microwave Corp., Port Chester, N.Y.

Filed Sep. 7, 1983, Ser. No. 529,948

Int. Cl.³ H01P *1/11*

U.S. Cl. 333—1.1 **13 Claims**



1. A reciprocal RF switch having an input terminal and at least first, second and third output terminals, comprising:

a first circulator having a first port connected to said input terminal, and having a second port and another port, both non-reciprocally coupled to said first port;

a second four-port circulator having a first port, a second port connected to said first output terminal, a fourth port connected to said second output terminal and a third port isolated from said first port;

a third circulator having a first port connected to said second port of said first circulator, a second port connected to said first port of said second circulator, and another port;

fourth circulator means having a first port connected to said other port of said third circulator, a second port connected to said third port of said second circulator, a third port connected to said other port of said first circulator and a fourth port connected to said third output terminal;

and means for selectively switching the direction of RF energy through at least some of said circulators to provide

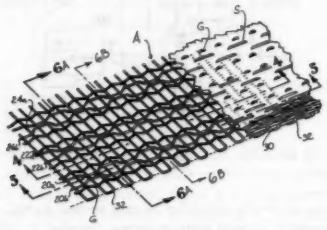
reciprocal RF paths between said input terminal and a selected one of said output terminals.

4,527,135

WOVEN CONTROLLED BALANCED TRANSMISSION LINE

Douglas E. Piper, Greenville, S.C., assignor to Woven Electronics Corp., Mauldin, S.C.

Filed Jun. 20, 1983, Ser. No. 506,112
Int. Cl.³ H01P *3/02*
U.S. Cl. 333—5 **12 Claims**



1. A woven balanced-line transmission cable for transmitting split differential voltage signals from a differential driver to a differential receiver comprising:

a plurality of elongated signal conductor wires extending longitudinally in a warp direction in said cable;

said signal conductor wires arranged in balanced-line signal wire pairs consisting of first and second signal wires for connection to an output of said differential driver for transmitting a split balanced signal consisting of first and second signals of equal amplitude and opposite polarity and for connection to an input of said differential receiver providing an input signal thereto representative of the difference between said first and second signals;

said first and second balanced-line signal wires disposed parallel to one another and generally side-by-side one another in laterally spaced vertical planes;

said first and second signal wires having a desired vertical displacement relative to each other in said vertical planes;

a ground conductor wire between each balanced-line signal wire pair minimizing the affects of exterior ground planes; and

warp and weft fiber yarns woven in the warp and weft directions with one another and said signal and ground conductor wires to fix the position of said conductor wires in said cable.

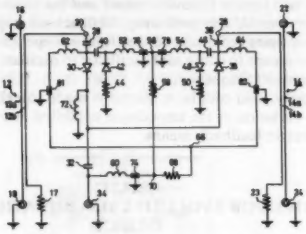
4,527,136

SIGNAL COUPLING APPARATUS

Kimitaka Kamiya, Osaka, Japan, assignor to 501 DX Antenna Company, Limited, Kobe, Japan

Filed Feb. 6, 1984, Ser. No. 577,230
Claims priority, application Japan, Feb. 15, 1983, 58-24272
Int. Cl.³ H01P *1/15*
U.S. Cl. 333—103 **2 Claims**

1. Signal coupling apparatus for selectively coupling either of two signals transmitted along first and second main transmission lines, respectively, to a single branch line; comprising first and second directional couplers adapted for insertion in said first and second main transmission lines, respectively, with each being provided with a branch terminal; an output terminal adapted for connection to said branch line; a first diode coupled between said branch terminal of said first coupler and said output terminal; a second diode coupled between said branch terminal of said second coupler and said output terminal; said first and second diodes having first and second polarities, respectively, with respect to said output terminal; a first series connection of a third diode and a first dummy resistor coupled between the branch terminal of said first coupler and a reference potential point; a second series connection of a fourth diode and a second dummy resistor coupled between



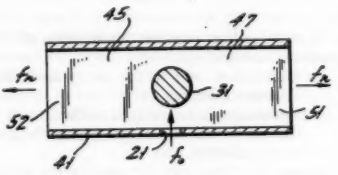
the branch terminal of said second coupler and said reference potential point; and said third and fourth diodes having said second and first polarities, respectively, with respect to said reference potential point.

4,527,137

EVANESCENT RESONATOR FREQUENCY MULTIPLIER

Joseph H. Hartley, Jackson, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 24, 1983, Ser. No. 544,764
Int. Cl.³ H01P *5/12, 1/20*
U.S. Cl. 333—137 **18 Claims**



1. A frequency multiplier for electromagnetic waves, comprising:

a metallic waveguide in which electromagnetic waves propagate at or above a cut-off frequency and in which electromagnetic waves below the cut-off frequency cannot propagate, the waveguide having a first output aperture at one end for coupling out electromagnetic waves therefrom;

an input aperture in a side wall of said waveguide;

a source for introducing input waves at a predetermined input frequency below the cut-off frequency through said input aperture into the waveguide; and

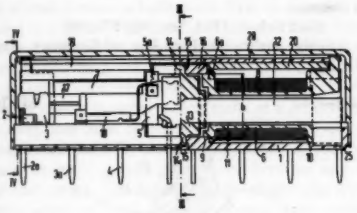
a conductive post positioned on an inner wall and extending transversely toward the opposite wall of said waveguide to provide a predetermined narrow gap therebetween, the dimensions of said gap and post and waveguide determining said input frequency, said post being positioned at a location spaced longitudinally from the output aperture and laterally from the input aperture and including a coating of multiplier material disposed on a surface of said post providing a non-linear response for receiving said input frequency waves from said source and for generating waves at a predetermined output frequency greater than the cut-off frequency, said narrow gap between said post and opposite wall being empty except for any portion occupied by said multiplier material.

4,527,138

ELECTROMAGNETIC ROTATING ARMATURE RELAY

Helmut Schedele, Diessen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 586,988
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315168
Int. Cl.³ H01H 51/27
U.S. Cl. 335—81 6 Claims



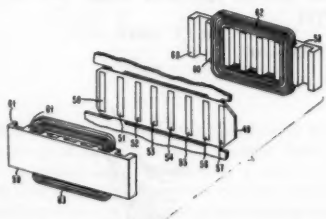
1. An electromagnetic rotating armature relay comprising:
a base,
a pair of hollow coil bodies in axial alignment along said base,
a beam rotating armature extending axially through the insides of said coil bodies,
a bearing element of insulating material disposed centrally of said armature,
said bearing element having a first neck portion received in said base,
a sole plate connecting said pair of coil bodies,
said bearing element having a second neck portion received in said sole plate,
a yoke at each end of the armature and forming a working air gap therebetween, and
a pair of permanent magnets actuating said yoke and disposed above said coil bodies.

4,527,139

ELECTROMAGNETIC RAM ACTUATOR

Armin Bohg, Weil-Neuweiler; Kurt Hartmann, Calw-Heumaden, and Horst Matthaei, Waldenbuch, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 30, 1984, Ser. No. 615,498
Claims priority, application European Pat. Off., Jun. 1, 1983, 83105444.0
Int. Cl.³ H01F 7/08
U.S. Cl. 335—256 4 Claims



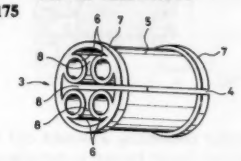
1. An electromagnetic ram actuator comprising magnetically permeable yoke means providing a plurality of pairs of interconnected symmetrical legs forming at least two separate magnetic flux conducting loops, a plurality of aligned gaps intersecting said loops, a ram member movably supported in said aligned gaps, means yieldably urging said ram member to a rest position, said ram member comprising a body carrying a plurality of magnetically permeable armature bars which in said rest position are adjacent to and offset from respective ones of said gaps, and an activating coil having a plurality of turns that pass through both of said loops.

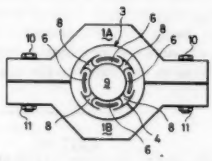
4,527,140

SPLIT TYPE ZERO-PHASE TRANSFORMER WITH HOLDER FOR MOUNTING ON AN ELECTRICAL CABLE

Kenzi Kimura, Sakura, and Hiroyuki Kanda, Iwatsuki, both of Japan, assignors to Midori-Anzen Industry Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1983, Ser. No. 510,430
Claims priority, application Japan, Jul. 10, 1982, 57-104720
Int. Cl.³ H01F 40/06
U.S. Cl. 336—175 4 Claims



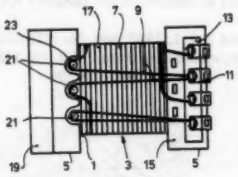


1. In combination,
a split type zero-phase current transformer having upper and lower members and means for detachably coupling said upper member to said lower member, said upper and lower members forming an aperture for mounting about an electrical cable when said upper member is coupled to said lower member,
a holder for mounting said transformer on an electrical cable comprising a cylindrical portion having an axial bore and made of flexible material dimensioned for mounting within the aperture of said transformer, said cylindrical portion having an upper portion and a lower portion with an axially extending slit extending over the entire length thereof for forced resilient separation of said upper portion from said lower portion along said slit for insertion of an electrical cable into the axial bore of said cylindrical portion, and at least one deformable protrusion protruding inwardly from the inner surface of said cylindrical portion and being configured for deformation to immovably mount the tranformer and holder to an electric cable when the electrical cable extends through the axial bore of the cylindrical portion of the holder mounted within the aperture of the coupled members of the transformer,
an electrical conductor cable inserted through the axial slit of said holder so as to extend through the axial bore of said cylindrical portion in abutting contact with said at least one deformable protrusion, and
said holder being mounted between said upper and lower members of said transformer with said upper member being coupled to said lower member so as to compress said protrusion against said electric cable causing deformation sufficient to immovably secure said transformer to said electrical cable.

4,527,141
TRANSFORMER COMPRISING A WOUND COIL FORMER

Sieghard Post, Guntersdorf, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 1, 1983, Ser. No. 481,113
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212061
Int. Cl.³ H01F 15/10
U.S. Cl. 336—192 2 Claims

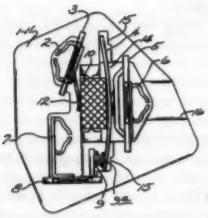


1. A transformer comprising a wound coil former having first and second coil flanges located at opposite ends of the coil former, at least one strip comprising connection eyelets arranged on an edge portion of the first coil flange and connected to winding wire ends emerging from the winding, a plurality of recesses in an edge portion of the second flange, each recess containing a guide pin, facing surfaces of each recess and said guide pin therein defining a guide track for wire guides, the second flange edge portion, viewed throughout the surface of the winding, being located opposite the edge portion of the first flange, the winding wire ends being tensioned around the guide pins so as to be guided to the connection eyelets of the connection strip.

4,527,142
DELAYED-ACTION THERMAL RELAY

Pietro De Filippis, Aversa; Amedeo Salvatore, Naples; Ciro Calenda, Aversa, and Giuseppe Notaro, Pomigliano D'Arco, all of Italy, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 16, 1983, Ser. No. 532,863
Int. Cl.³ H01H 61/02, 71/16
U.S. Cl. 337—105 7 Claims

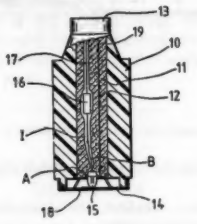


1. A delayed-action thermal relay, particularly for starting single-phase induction motors having main and start windings, comprising a case of insulating material; a first, a second, and a third terminal mounted on the case, for connecting the windings in an electrical circuit to a power source, and thermally-responsive actuator means for the relay characterized in that the actuator means comprises an electrical resistance heating element and a bimetallic disk having the heating element disposed in heat-transfer relation to the disk; a first contact is carried by the third terminal and a second contact is carried by the bimetallic disk to be moved into and out of engagement with the first contact to control energizing of the start winding of the motor; and the heating element and bimetallic disk are engaged with each other and forcibly fitted in an operative position between the first and second terminals to engage and electrically connect the heating element and disk to the first and second terminals respectively for permitting selective energizing and deenergizing of the heating element to move the bimetallic disk to regulate the engagement and disengagement of the contacts.

4,527,143
SAFETY FUSE CARTRIDGE

Bernhard Thienel, In der Burbach 30, D-5900 Siegen 21, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,008
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 8322638[U]
Int. Cl.³ H01H 85/32
U.S. Cl. 337—242 13 Claims

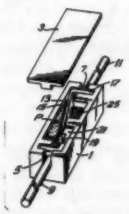


1. A safety fuse cartridge, comprising:
a porcelain body having only a single through-bore necessary therein that forms an inner chamber, which contains a bed of sand and which includes a lower contact base and an upper contact end;
a fuse wire, which is embedded in said bed of sand and extends between said contact base and said contact end;
an indicator in the form of a glow lamp; and
a high-valued resistor, which also is embedded in said bed of sand, and via which said glow lamp is connected parallel to said fuse wire, said fuse wire and said high-valued resistor being disposed in the same bed of sand which assures not only that heat generated by said high-valued resistor is uniformly dissipated on all sides through the sand so that said resistor cannot heat up unevenly but also the same bed of sand is used advantageously when said fuse wire has melted.

4,527,144
THERMAL CUT-OFF DEVICE

Hiroo Arikawa, Setagaya, Japan, assignor to S.O.C. Corporation, Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 550,001
Claims priority, application Japan, Nov. 11, 1982, 57-169869[U]
Int. Cl.³ H01H 37/76
U.S. Cl. 337—407 8 Claims



1. A temperature responsive electrical cut-off device com-

prising a casing and a cover for said casing both made of a highly heat conductive, electrically insulating material, an electrical circuit assembly within said casing, a pair of electrically conductive wires having ends protroding from said casing for connection into an exterior electrical circuit board, the other ends of said wires being connected to said electrical assembly in said casing, said electrical assembly including a conductive fixed terminal, a metal leaf spring having an intermediate elongated portion extending axially in said casing, a bent foot portion securely positioned at one end of said casing and a head portion in knife-blade form at the other end of said casing in contact with said fixed terminal; said fixed terminal having a generally V-shaped groove whose angle is sufficiently more obtuse than the angle of said knife-blade, thereby enabling said V-shaped groove to consummate a closed circuit; a mass of plastic material which melts at a predetermined temperature, said mass of plastic material biasing said leaf spring toward said fixed terminal during closed circuit condition; a helical spring normally compressed between said leaf spring and said casing, said helical spring cooperating with said leaf spring when said leaf spring is released upon melting of said plastic material to stabilize said leaf spring.

4,527,145

METHOD AND APPARATUS FOR THE DIGITAL CONTROL OF THE PHASE OF THE SYSTEM CLOCK OF A DIGITAL SIGNAL PROCESSING SYSTEM

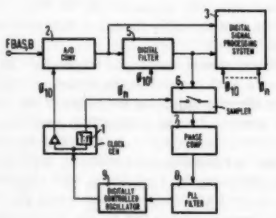
Wolfgang Haussmann, Munich, and Rainer Lüder, Oberhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 416,031

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136522

Int. Cl.³ H04N *9/46*

U.S. Cl. 358—19 **14 Claims**



1. Method for digitally controlling the phase of the system clock frequency of a digital signal processing system which processes an analog signal containing a reference signal, wherein a fixed phase relation exists between the reference signal and the system clock frequency, which comprises digitalizing the reference signal by sampling the analog reference signal, weighting the scanning values of the digitalized reference signal for obtaining a digital phase comparison variable, feeding the phase comparison variable through a digital PLL filter to a digitally controlled oscillator, and deriving the system clock frequency from the output signal of the digitally controlled oscillator.

4,527,146

VARISTOR

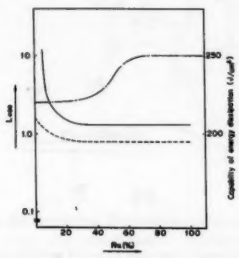
Hideyuki Kanai, Kawasaki; Osamu Furukawa, Sagamihara; Motomasa Imai, and Takashi Takahashi, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 22, 1983, Ser. No. 564,100

Claims priority, application Japan, Dec. 24, 1982, 57-226207; Sep. 30, 1983, 58-180171

Int. Cl.³ H01C *7/10*

U.S. Cl. 338—20 **12 Claims**



1. A varistor comprising a sintered body which consists essentially of:

a basic component consisting essentially of zinc oxide as a principal constituent and, as auxiliary constituents, bismuth, cobalt, manganese, antimony and nickel in an amount, when calculated in terms of Bi_2O_3, Co_2O_3, MnO, Sb_2O_3 and NiO, respectively, of Bi_2O_3: 0.1 to 5 mol %, Co_2O_3: 0.1 to 5 mol %, MnO: 0.1 to 5 mol %, Sb_2O_3: 0.1 to 5 mol % and NiO: 0.1 to 5 mol %; and

an additional component comprising boron in an amount, when calculated in terms of B_2O_3, of 0.001 to 1 wt % based on said basic component,

said Bi_2O_3 comprising not less than 30% of α-phase, said sintered body being substantially free of chromium.

4,527,147

HIGH VOLTAGE VARIABLE RESISTOR WITH IMPROVED CENTRAL SLIDER CONTACT CONSTRUCTION

Hajime Arakawa, Yokaichi, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 19, 1983, Ser. No. 486,372

Claims priority, application Japan, Apr. 30, 1982, 57-73876

Int. Cl.³ H01C *10/32, 10/34*

U.S. Cl. 338—162 **5 Claims**

1. A high voltage variable resistor comprising:

an insulating substrate;

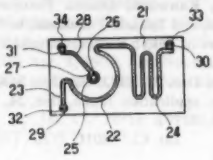
an arcuate film resistor defined on said insulating substrate;

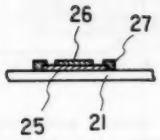
an electrically conductive central electrode located at said substrate and formed of a mixture of glass frit and a conductive material selected from the group Ag, Ag-Pd and Ag-Pt, the glass frit comprising about 0 to 10 percent by weight of said mixture, said electrode being substantially surrounded by said arcuate film resistor;

a central film resistor located on but not fully covering said central electrode;

an outer film resistor surrounding said central electrode and overlapping the circumferential periphery of said central electrode, said outer film resistor being spacially separated from said central film resistor whereby cracks which may develop in said first film resistor are not transmitted to said outer film resistor; and

a slider having a first rotatable contact electrically contacting said central film resistor and being slidably rotatable





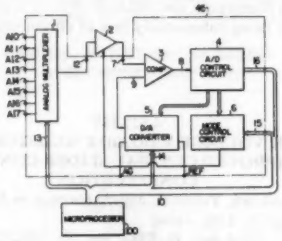
thereabove and a second contact which is adapted to slide along said arcuate film resistor when said slider is rotated.

4,527,148

ANALOG-DIGITAL CONVERTER

Shigeo Kuboki, Nakaminato; Kazuo Kato, Ibaraki, and Nobuaki Miyakawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 115,146, Jan. 24, 1980, abandoned. This application Oct. 28, 1982, Ser. No. 437,303
Claims priority, application Japan, Jan. 26, 1979, 54-7910
Int. Cl.³ H03K *13/02, 13/03*
U.S. Cl. 340—347 AD **7 Claims**



1. An apparatus for converting an analog signal into a digital signal in a selected gain mode and adapted to be arranged in the form of a single chip LSI, said apparatus comprising:

first terminal means for receiving an analog signal;

second terminal means for connecting an external variable gain amplifier so as to amplify said received analog signal, the gain of said amplifier being variable according to a gain select signal applied thereto;

a register for storing data for determining the gain mode of said variable gain amplifier, said data being settable according to a command externally applied thereof;

a successive approximation A/D converter disposed to receive an analog signal amplified by said amplifier, said converter being operative to convert said amplified signal into a digital signal whose digits are determined successively from a digit of highest order to a digit of lowest order by successive comparison of said amplified analog signal with different levels of reference signals;

a mode control gate means coupled to an output of said successive approximation A/D converter and responsive to a determination by said A/D converter of the values of a predetermined number of higher order digits of the digital signal obtained during the operation of A/D conversion of the amplified analog signal by said A/D converter, said predetermined number being determined according to the mode set by said data stored in said register for producing a first signal indicative of whether the gain of said amplifier is to be changed or not depending on said determined values of the higher order digits;

third terminal means for coupling said first signal externally of said apparatus so that said first signal is supplied, as said gain select signal, to said amplifier connected to said first terminal means; and

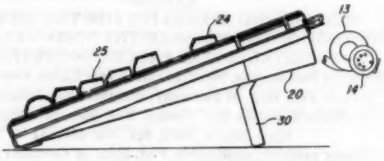
said mode control gate means further producing a second signal which causes said A/D converter to continue its operation of A/D conversion of said amplified analog signal when the gain of said amplifier is not to be changed and to stop its operation of A/D conversion of said amplified analog signal when the gain of said amplifier is to be changed and again start its operation to effect the A/D conversion on the newly amplified analog signal after the gain of said amplifier has been changed according to said first signal.

4,527,149

DATA DISPLAY KEYBOARD WITH ANGULAR POSITIONING

Michael W. Swensen, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 28, 1983, Ser. No. 461,810
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 R **10 Claims**



1. Manual input for providing electrical inputs to data handling apparatus, comprising:

(a) a frame assembly;

(b) a keyboard assembly mounted on the frame assembly;

(c) at least one foot movably mounted mounted to the frame assembly;

(d) latch/release means connected to the foot to permit the foot to move with respect to the frame assembly between two limits, thereby adjusting the angle of the frame assembly with respect to the supporting surface, the latch-/release means including a selectively actuable clutch mechanism for releasing and positively latching the foot at any angle between the two limits, and displacing means for moving the foot relative to the frame assembly; and

(e) actuating means, connected to the latch/release means for manual release and selective latching of the foot at any desired angle between the frame assembly and the supporting surface between the two limits.

4,527,150

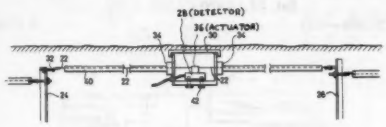
INTRUSION DETECTION SYSTEM

Chaim Porat, Beer-Sheva, Israel, assignor to Beta Engineering & Industrial Development, Beersheba, Israel

Filed Sep. 30, 1982, Ser. No. 430,660
Claims priority, application Israel, Jun. 11, 1982, 66040
Int. Cl.³ G08B *13/12*
U.S. Cl. 340—541 **16 Claims**

1. An underground intrusion detection system including a

taut sensor wire buried in the ground and connected to an intrusion detector for detecting an attempted intrusion by producing an electrical signal when the sensor wire is cut or disturbed, characterized in that said sensor wire is tensioned between a pair of ground stakes buried in the ground and is enclosed within a conduit buried in the ground and having a longitudinal passageway of slightly greater inner diameter than the outer diameter of the sensor wire so that the sensor wire is

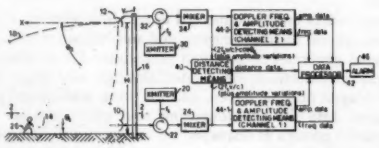


freely movable therein, said conduit being sufficiently rigid to make said passagway collapse-resistant such that the conduit maintains the free movement of the sensor wire in its passageway when both the conduit and its sensor wire are buried in the ground, said conduit being sufficiently flexible in its length to flex when disturbed by an attempted intruder to apply a force to the sensor wire and thereby to cause the sensor wire to actuate the detector.

4,527,151
METHOD AND APPARATUS FOR INTRUSION DETECTION

George C. Byrne, Los Altos, Calif., assignor to SRI International, Menlo Park, Calif.

Filed May 3, 1982, Ser. No. 374,181
Int. Cl.³ G01S *13/52*
U.S. Cl. 340—554 **20 Claims**



1. In an intrusion detection system for detecting the presence of an intruder moving along the ground in a surveillance area, the combination comprising,

a first Doppler radar system comprising first antenna means at a first level adjacent ground level having a radiation pattern for illuminating the surveillance area and providing a first Doppler difference frequency signal in response to movement of an intruder in said surveillance area,

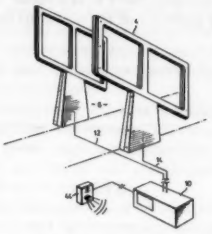
a second Doppler radar system comprising second antenna means having a radiation pattern for substantially illuminating said surveillance area from a spaced position substantially directly above said first antenna and providing a second Doppler difference frequency signal in response to movement of an intruder in said surveillance area, the first Doppler difference frequency remaining substantially constant while the second Doppler difference frequency decreases upon approach of an intruder at a substantially constant radial velocity with respect to said first antenna means, and

means responsive to said first and second Doppler difference frequency signals for generating a signal proportional to distance of a moving intruder from at least one of said first and second antenna means.

4,527,152
ANTI-SHOPLIFTING SYSTEM

Roger Scarr, Pickering, Canada, and Edward R. Fearon, Richardson, Tex., assignors to Shin International, Inc., Southfield, Mich.

Filed Sep. 10, 1980, Ser. No. 186,003
Claims priority, application Canada, Sep. 14, 1979, 335657
Int. Cl.³ G08B *13/26*
U.S. Cl. 340—572 **31 Claims**

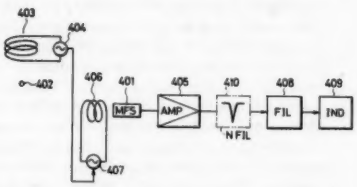


1. In a system for detecting the passage of an object through a surveillance zone, the combination including; means for generating an oscillatory magnetic interrogation field within said surveillance zone, said magnetic field having three separate and distinct vector components therewithin by driving transmitting coil means flanking said surveillance zone with an alternating power source repetitively in and out of phase with respect to one another so as to produce oscillating magnetic lines of flux having one vector component at the time the transmitting coils are in the aiding configuration that forms the in-phase mode and two vector components at the time the transmitting coils are in the opposing configuration that forms the out-of-phase mode; ferromagnetic marker means attachable to an object; and means for detecting a signal generated by said marker means in response to said generated oscillating magnetic lines of flux within said surveillance zone.

4,527,153
DETECTABLE ELEMENT AND SENSOR

Kenichi Suzuki, Isehara, and Kazunari Yamada, Atsugi, both of Japan, assignors to Kazunari Yamada, Kanagawa, Japan

Filed Jul. 26, 1982, Ser. No. 402,013
Claims priority, application Japan, Aug. 18, 1981, 56-129514
Int. Cl.³ G08B *13/24*
U.S. Cl. 340—572 **10 Claims**



1. A system for detecting the presence of an object comprising:

a detectable element including a capsule made of a nonmagnetic material and having a permanent magnet therein which is freely movable within said capsule, said detectable element being attached to the object to be detected;

means for generating an alternating magnetic field of a predetermined frequency which causes said permanent magnet to move inside said capsule when said detectable element is near said generating means;

sensor means disposed near said generating means for detect-

ing a magnetic wave emanating from said detectable element upon movement of said permanent magnet, said sensor means being operative to produce an electric signal;

filter means for extracting from said electric signal a signal component of a frequency which is related to the frequency of said alternating magnetic field but different therefrom; and

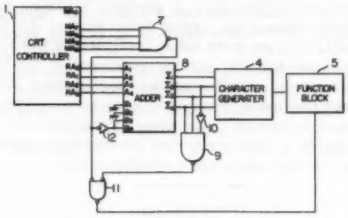
an indicator responsive to said signal component for indicating the presence of the object to be detected.

4,527,154

DISPLAY SYSTEM

Kazuyuki Tanaka, Kamakura, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Dec. 17, 1981, Ser. No. 331,818
Claims priority, application Japan, Dec. 26, 1980, 55-186398
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—221 **3 Claims**



1. A display system comprising:

a screen memory having a one-to-one correspondence to characters to be displayed on a raster scan type CRT;

a character generator for generating a bit stream indicative of a character selected by an output from said screen memory;

a CRT control circuit for generating display addresses each corresponding to one of the display positions on said CRT and a raster addresses for selecting the relation between a character block of said character generator and the scanning lines of characters to be displayed on said CRT, each said display address being coupled to said screen memory;

a raster address shifting circuit for shifting said raster addresses by a predetermined numerical amount to provide output address signals to said character generator;

a display address detection circuit for receiving said display addresses from said CRT control circuit to provide a display address detection signal to said shifting circuit, so that the order of raster addresses applied to said character generator by said shifting circuit is varied in accordance with the display address detection signal of said display address detection circuit; and

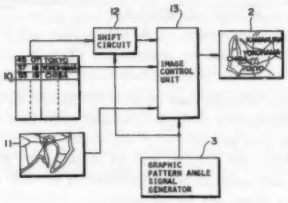
a raster address detection circuit for receiving the output address signals from said shifting circuit, and a gate circuit for receiving a raster address detection signal from said raster address detection circuit and the display address detection signal from said display address detection circuit to provide a gate signal indicative of a status line to said CRT.

4,527,155

SYSTEM FOR MAINTAINING AN ORIENTATION OF CHARACTERS DISPLAYED WITH A ROTATABLE IMAGE

Kiyoshi Yamaki; Hidetaka Suzuki; Haruto Tanaka, and Yasuhisa Takeuchi, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 2, 1982, Ser. No. 354,036
Claims priority, application Japan, Mar. 4, 1981, 56-30700
Int. Cl.³ G09G *1/00, 3/00*
U.S. Cl. 340—727 **6 Claims**



1. Apparatus for displaying on a screen a graphic pattern and characters superimposed at predetermined positions on said graphic pattern comprising:

first memory means for storing graphic data from which said graphic pattern is generated on said screen;

second memory means for storing coded data from which said characters are generated on said screen, and for storing positional data for said predetermined positions on said graphic pattern;

signal generator means for outputting a command signal to rotate through an angle θ said graphic pattern as displayed on said screen;

shift circuit means connected to said second memory means and said signal generator means for providing shifted positional data in accordance with the command signal; and

image control means connected to said first memory means, said second memory means, said shift circuit means, said signal generator means, and said screen for causing said graphic pattern to be rotated through said angle θ as displayed on said screen, and for using said shifted positional data for superimposing said characters on said graphic pattern as displayed on said screen at said predetermined positions with respect to said graphic pattern so that said characters have a vertical orientation on said screen independent of said rotation of said graphic pattern.

4,527,156

DIGITAL PROCESSING AND COMPARISON DEVICE

Nicholas F. Nawrocki, and Matt R. Dodson, both of Toledo, Ohio, assignors to Helm Instrument Company, Inc., Maumee, Ohio

Continuation of Ser. No. 273,329, Jun. 15, 1981, abandoned. This application Oct. 19, 1983, Ser. No. 543,219
Int. Cl.³ G09G *3/00*
U.S. Cl. 340—753 **1 Claim**

1. A method of indicating a quantity of electrical information represented by an input signal having a value proportional to the quantity to be indicated comprising the steps of:

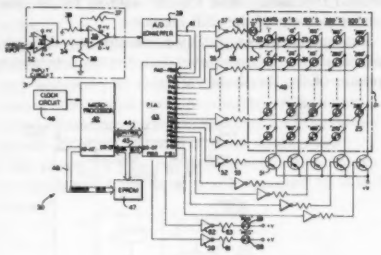
a. generating a plurality of reference signals each having a different value;

b. individually comparing the value of the input signal with each of said reference signals in a predetermined order until the value of the input signal falls between the values of two consecutive ones of said reference signals;

c. storing a plurality of first indicating signals corresponding to each of said reference signals having values equal to

and less than the value of the lesser one of said two consecutive reference signals in step (b);

d. subtracting the value of said lesser one of said two consecutive reference signals in step (b) from the value of the



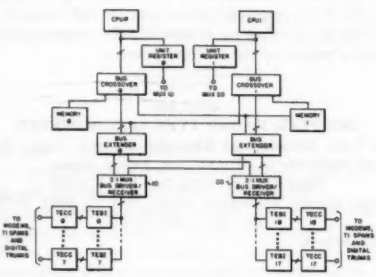
input signal and storing at least one second indicating signal representing the value of the difference; and

e. generating an indication of the quantity of electrical information represented by the input signal in response to said first and second stored indicating signals.

4,527,157
SINGLE FAULT TOLERANT CCIS DATA LINK ARRANGEMENT

Krikor A. Krikor, Glendale, Ariz., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Sep. 30, 1982, Ser. No. 429,742
Int. Cl.[3] **H04Q** *11/04;* **G06F** *15/16*
U.S. Cl. 340—825.01 **5 Claims**



1. In a CCIS data transmission system including first and second switching offices connected via said system, a fault tolerant CCIS data link arrangement comprising:

each said switching office including:

CPU means;

first and second pluralities of terminal equipment connected to said CPU means including respective pluralities of first and second data links for transferring data;

said CPU means including:

first and second CPUs; a first cable connection from said first plurality of terminal equipment to said first and second CPUs; a second cable connection from said second plurality of terminal equipment to said first and second CPUs; first and second CPU buses corresponding to said first and second CPUs respectively; first and second bus cross-overs corresponding to said first and second CPUs, each cross-over connected to said corresponding CPU via said corresponding CPU bus and to said other CPU via said other CPU bus, for connecting said first CPU to said second CPU bus and for connecting said second CPU to said first CPU bus; corresponding first and second memories connected to each corresponding bus cross-over; corresponding first and second bus extenders connected to each said bus cross-over and to each said memory; and said first and second CPUs being interconnected via said CPU buses and said bus cross-overs whereby said first CPU is active and said second CPU functions as a ready standby or alternatively said second CPU is active and said first CPU functions as a ready standby;

each said switching office further including:

said first and said second switching offices connected via at least one of said first and one of said second data links;

each plurality of said terminal equipment connected to said CPU means and operated to transfer data between said first and second offices;

first and second multiplexer units, each multiplexer unit connected to said first and second CPUs via said corresponding CPU buses, each said multiplexer unit operated to connect any one of said pluralities of terminal equipment with said active CPU;

first and second registers connected between said first and second CPUs and said corresponding multiplexers and each register operated to selectively enable said active CPU to be connected to specific ones of said pluralities of terminal equipment for transmitting data from any of said pluralities of terminal equipment to said active CPU via said corresponding CPU bus;

first and second power generation means corresponding to said first and second pluralities of terminal equipment and each said power generation means operated to provide a plurality of distinct voltage levels to said corresponding plurality of terminal equipment;

first and second power buses connected between said first and second pluralities of terminal equipment and said corresponding first and second power generation means respectively, said power buses operated in response to said first and second power generation means to transmit said voltage levels from said first and second power generation means to said first and second pluralities of terminal equipment respectively;

said CPU means of said first switching office operated to transfer said data through one of said first and one of second plurality of data links to said second switching office and said CPU means of said second switching office operated to transfer said data through one of said first and one of said second plurality of data links to said first switching office; and

said CPU means of each of said switching offices operated to select one of said first data links to transfer all said data between first and second switching offices for a malfunction of said second power generation means or alternatively said CPU means of each of said switching offices operated to select one of said second data links to transfer all said data between said first and second switching offices for a malfunction of said first power generation means.

4,527,158
AIRCRAFT COLLISION PILOT WARNING INDICATING SYSTEM

Russell W. Runnels, 528 Greene Rd., Martinsville, Ohio 45146

Filed Jul. 29, 1982, Ser. No. 403,165
Int. Cl.[3] **G08G** *5/00*
U.S. Cl. 340—961 **3 Claims**

1. A passive aircraft warning system for warning a host aircraft, having a heading in an azimuthal bearing system, of the presence of an object, comprising:

(a) a conventional warning flashing light having the conventional characteristics of flashing at a substantially uniform rate of approximately 50 to 150 times per minute with substantially uniform flash durations of approximately 100 to 400 microseconds positioned on said object;

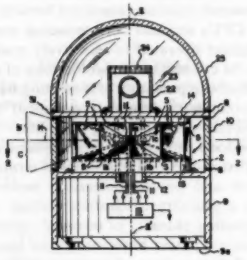
(b) a plurality of light detectors each providing an indepen-

dent electrical output responsive to their respective light input;

(c) means for positioning on said host aircraft the said plurality of light detectors such that each detector is optically shielded to view a predetermined independent sector area in relation to said azimuthal heading and said plurality of detectors provide substantially 360° panoramic light detection;

(d) a plurality of electronic amplification and control channels, in one-to-one correspondence with said plurality of light detectors, each amplifier and control channel primarily responsive to said warning light characteristics substantially providing an electrical output signal only when its associated detector detects light having said warning light characteristics, and

wherein each of said electronic amplification and control channels includes a comparator, a noise-averaging circuit, and a threshold adjust circuit with said noise-average



circuit and said threshold adjust circuit providing input signals of opposite polarity to said comparator whereby the said comparator provides an output signal of one polarity when a warning light is detected and an output signal of the opposite polarity from averaged pulses;

(e) means for inhibiting the said input of any said channel when the associated said light detector of said channel receives direct sunlight with an intensity above a predetermined value;

(f) means for providing a plurality of indicators in one-to-one correspondence with said plurality of electronic and control channels for providing a respective indication responsive to the said electrical output of a respective channel; and

(g) means for correlating each of the said indicators with its associated detector viewing a respective section in azimuth whereby the direction of a detected warning light is indicated.

4,527,159

THRESHOLD CIRCUIT FOR RADAR VIDEO DATA

Jan Bergman, Haaksbergen, Netherlands, assignor to Hollandse Signaalapparaten, B.V., Hengelo, Netherlands

Filed Nov. 23, 1981, Ser. No. 324,231

Claims priority, application Netherlands, Dec. 22, 1980, 8006950

Int. Cl.³ G01S *7/02*

U.S. Cl. 343—7 A **3 Claims**

1. A threshold circuit comprising:

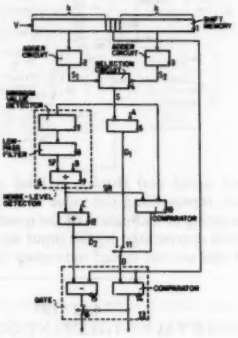
(a) a shift memory including k first elements, at least one center element, and k last elements, for receiving radar video data;

(b) first and second adder circuits electrically-connected to the shift memory for producing, from the data in the k first elements and in the k last elements, signals representing first and second sums, respectively;

(c) a selection circuit electrically-connected to the first and second adder circuits for passing the signal representing the larger of the first and second sums, said larger sum representing a first threshold value for the data in the at least one center element of the shift memory;

(d) a noise level detector electrically-connected to the selection circuit for producing an output signal representing a second threshold value for the data in the at least one center element of the shift memory;

(e) a comparator electrically-connected to the selection circuit and to the noise level detector for determining the greater of the threshold values;



(f) switching means electrically-controlled by the comparator for passing a signal representing the greater of the two threshold values; and

(g) a gate circuit electrically-connected to the shift memory for decreasing the value of data from said shift memory by the second threshold value, and for passing the decreased value if the respective data from the shift memory has a value greater than the threshold value represented by the signal passed by the switching means.

4,527,160

DOPPLER RADAR TYPE SPEEDOMETER

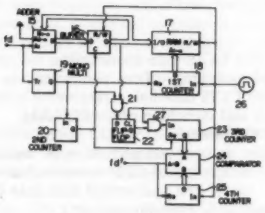
Akira Endo, Katsuta, and Katsuhiro Kimura, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,860

Claims priority, application Japan, May 27, 1981, 56-79338

Int. Cl.³ G01S *13/60*

U.S. Cl. 343—8 **6 Claims**



1. A Doppler radar type speedometer comprising:

(a) a Doppler radar mounted on a moving body for transmitting microwaves of predetermined frequency and for receiving part of the waves reflected from the ground;

(b) first means for amplifying and shaping the waveform of said received waves to provide a train of output pulse signals of various pulse widths and of level "1", a rise time point of each of said output pulse signals being used as a reference time point;

(c) second means for adding levels of a predetermined number n of said output pulse signals at each time point deter-

mined by the number of predetermined time intervals starting from said reference time point;

(d) third means including a random access memory for storing each result of addition of the levels at each time point in an address thereof corresponding to each time point;

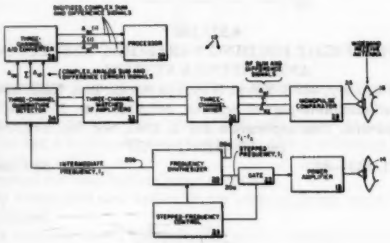
(e) fourth means for counting the number of the levels "1" at the most significant bits of said addition results stored at said addresses to thereby detect the pulse width of an output pulse signal corresponding to a n/2-th output pulse signal of said predetermined number n of the output pulse signals arranged in order of pulse widths; and

(f) fifth means for displaying the speed of the moving body on the basis of the pulse width detected by said fourth means.

4,527,161
3D IMAGING WITH STEPPED FREQUENCY WAVEFORMS AND MONOPULSE PROCESSING

Donald R. Wehner, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 8, 1981, Ser. No. 300,344
Int. Cl.³ G01S *13/44, 13/89*
U.S. Cl. 343—16 M **4 Claims**



1. A radar system comprising:

radar antenna means for transmitting and receiving radar signals and radar echo signals, respectively,

frequency generator means having first, second and third outputs for generating N sets of n stepped frequency pulses each at the frequencies f_i on said first output, for generating a fixed intermediate frequency signal at the frequency f_I on said second output and for generating N sets of n stepped frequency pulses at the frequencies f_i–f_I on said third output;

a gate network connected between said frequency generator means first output and said antenna means for gating to said antenna means a selected portion of each of said n pulses of said frequency generator means first output;

a monopulse comparator connected to said antenna means for generating first and second difference signal outputs and a sum signal output;

a three channel mixer having a first input connected to said frequency generator third output and a second input connected to said monopulse comparator first and second signal and sum signal outputs;

an amplifier connected to said three channel mixer;

a three channel quadrature detector connected to said amplifier and to said frequency generator means for producing first and second sets of homodyned difference outputs and a set of homodyned sum outputs;

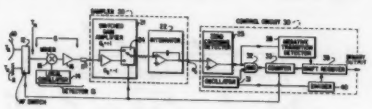
an A/D converter having an input connected to said three channel quadrature detector sum and difference outputs and having an output; and

a processor connected to said A/D converter output.

4,527,162
RADIOMETER

John I. Strickland, Nepean, Canada, assignor to Canadian Patents and Development Limited-Societe Canadien Ne Des Brevets Et D'Exploitation Limitee, Ottawa, Canada

Filed Jun. 11, 1982, Ser. No. 387,416
Claims priority, application Canada, Feb. 23, 1982, 396795
Int. Cl.³ H04B *7/00*
U.S. Cl. 343—351 **14 Claims**



1. A radiometer comprising

(a) first and second input means for electromagnetic energy within a selected bandwidth,

(b) a detector for said bandwith having an analog voltage output,

(c) switching means for selectively connecting one of said first and second input means to said detector,

(d) sampling means for receiving said detector output and for selectively integrating the same with gain of one sign to generate a voltage of increasing magnitude of a first slope and with gain of the other sign to generate a voltage of decreasing magnitude of a second slope, and

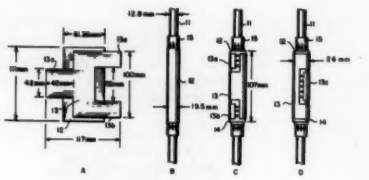
(e) control means connected to said switching means and said sampling means for connecting one of said input means to the detector when the gain is of one sign and the other of said input means to the detector when the gain is of the other sign,

(f) said control means including means for comparing the steepness of said slopes.

4,527,163
OMNIDIRECTIONAL, CIRCULARLY POLARIZED, CYLINDRICAL MICROSTRIP ANTENNA

Philip H. Stanton, Los Angeles, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Apr. 6, 1983, Ser. No. 482,464
Int. Cl.³ H01Q *1/38, 9/18*
U.S. Cl. 343—700 MS **7 Claims**



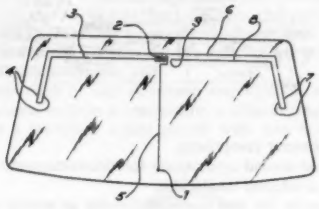
1. An omnidirectional, circularly polarized, antenna having at least one element comprising two concentric half-wave resonant subelements supported by a vertical conductive ground cylinder, one of said subelements being comprised of a conductive cylinder of half-wave resonant length separated from said ground cylinder by a dielectric cylinder, and the other of said subelements being comprised of a conductive sheet of half-wave resonant length, said conductive sheet being wrapped around said first subelement and separated therefrom by a dielectric cylinder, with at least two vertical radiating edges of said sheet, and means for feeding said subelements such that their far fields are subsequently equal and phased 90° from each other to produce a circularly polarized electromagnetic wave in the far field.

4,527,164

MULTIBAND AERIAL, ESPECIALLY SUITABLE FOR A MOTOR VEHICLE WINDOW

Massimo Cestaro, Vasto, and Oscar De Lena, Termoli, both of Italy, assignors to Societa Italiana Vetro-SIV-S.p.A., Italy

Filed Sep. 10, 1982, Ser. No. 416,547
Claims priority, application Italy, Sep. 15, 1981, 23971 A/81
Int. Cl.[3] H01Q *1/32*
U.S. Cl. 343—713 19 Claims



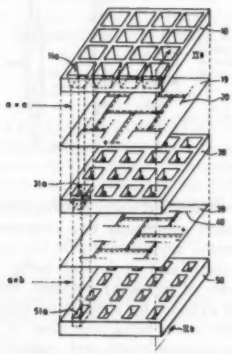
1. Multiband aerial window assembly, such as for a motor vehicle, which comprises an aerial window having an aerial circuit formed of one single continuous conductor wire, commencing from a signal pickup point and terminating in a single free end, and including an aerial section for FM and an aerial section for AM, with said sections being connected in series so as not to require phasing and being electrically isolated from each other by an inductor which is arranged to function in open circuit for the FM band and in short circuit for the AM band, said one single continuous conductor wire being a continuous wire which includes a series of corresponding generally vertical segments and generally horizontal segments which are arranged in a geometrically asymmetrical configuration for forming the aerial.

4,527,165

MINIATURE HORN ANTENNA ARRAY FOR CIRCULAR POLARIZATION

Frans C. de Ronde, Lesigny, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,941
Claims priority, application France, Mar. 12, 1982, 82 04252
Int. Cl.[3] H01Q *13/02*
U.S. Cl. 343—778 2 Claims



1. An antenna element for circularly-polarized high-frequency signals, said antenna element comprising, in succession:

a. a relatively thick first layer of insulating material having an opening therethrough defined by conductive side walls which are slanted to form a horn of square cross-section;

b. a relatively thin second layer of insulating material disposed adjacent to one side of the first layer where the horn has its narrowest cross-section, said second layer supporting a conductor oriented relative to the horn to couple signals having a first linear polarization;

c. a relatively thick third layer of insulating material disposed adjacent to the second layer, said third layer having an opening therethrough defined by conductive sidewalls which are stepped to form a first waveguide having two different cross-sectional areas, one end of said first waveguide facing and having the same square cross-section as the horn's narrowest end, and an opposite end of said waveguide having a smaller, rectangular cross-section;

d. a relatively thin fourth layer of insulating material disposed adjacent to the third layer, said fourth layer supporting a conductor oriented relative to the rectangular end of the first waveguide to couple signals having a second linear polarization which is perpendicular to that of said first linear polarization; and

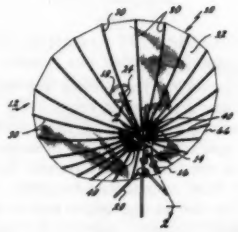
e. a relatively thick fifth layer of insulating material disposed adjacent to the fourth layer, said fifth layer having an opening therein defined by conductive sidewalls forming a second waveguide, said opening having a depth smaller than the thickness of the fifth layer, one end of said second waveguide facing and having the same rectangular cross-section as the smaller end of the first waveguide, and an opposite end of said second waveguide being short-circuited.

4,527,166

LIGHTWEIGHT FOLDING PARABOLIC REFLECTOR AND ANTENNA SYSTEM

Robert A. Luly, 449 S. Sierra Way, San Bernardino, Calif. 92406

Continuation-in-part of Ser. No. 247,922, Mar. 26, 1981, abandoned. This application Jul. 2, 1981, Ser. No. 279,734
Int. Cl.[3] H01Q *15/20*
U.S. Cl. 343—840 38 Claims



1. A reflector antenna assembly comprising:

a waveguide having a front end and a rear end and being open at both ends to electromagnetic radiation;

a foldable primary reflector supported by said waveguide for reflecting electromagnetic radiation towards said front end of said waveguide, said primary reflector including

a plurality of resiliently flexible normally straight spokes of diminishing stiffness along a radially outward direction such that each spoke is stressable to a desired reflector curvature, each spoke having an inner end and a tip, said inner ends being mounted for pivotal movement between a folded axial position and a deployed radial position relative to said waveguide;

restricting means connected to the radially outer tips of said spokes for restricting said spokes against full radial deployment;

means for simultaneously urging each of said radial spokes towards a fully radially deployed position whereby said spokes are stressed by said restricting means to a predetermined curvature;

elastic sheet means of reflecting material deployable by said

spokes and conforming to the curvature of said stressed spokes to define a dished reflecting surface;

means for retaining said spokes in said stressed deployed position; and

a secondary reflector mounted to said front end of said waveguide for reflecting said radiation into said waveguide.

4,527,167

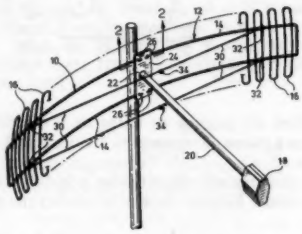
PARABOLIC REFLECTOR FORMED OF CONNECTABLE HALF-SECTIONS

Milorad Miladinovic, Lindsay, Canada, assignor to Lindsay Specialty Products Limited, Lindsay, Canada

Filed Mar. 22, 1983, Ser. No. 477,603

Int. Cl.³ H01Q *1/08, 19/12*

U.S. Cl. 343—840 **5 Claims**



1. A sectional parabolic reflector of improved construction comprising:

two similar parabolically curved half-reflector sections each having a longitudinal parabolic axis and a reflecting surface;

a mount for said half-reflector sections;

said mount and said half-reflector sections being separately formed;

said mount and said half-reflector sections being formed for manual manipulation together at joints;

said mount and half-reflector sections when manipulated together at said joints locking against movement of the half-reflector sections towards each other when they assume an operational position wherein their reflecting surfaces combine in a common parabolic surface;

locking means extending between each of said half-reflector sections at a location spaced from said joints and for locking said joints to maintain said half-reflector sections with their reflecting surfaces in said operational position;

said curved half-reflector sections each having lugs extending therefrom; said joints including said lugs and cooperating socket means on said mount;

said curved half-reflector sections each having a U-shaped wire frame, said lugs being formed at the free ends of the arms of said U-shape.

4,527,168

MOISTURE SEAL IN POWER OPERATED VEHICLE ANTENNA

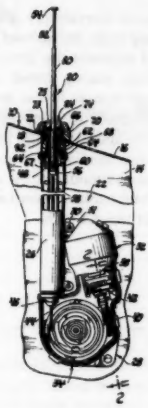
Ralph W. Edwards, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1983, Ser. No. 521,137

Int. Cl.³ H01Q *1/10*

U.S. Cl. 343—901 **3 Claims**

1. In a power operated antenna installation on a panel of a vehicle body including a stationary tube mounted on said body in alignment with an aperture in said panel, a first tube section disposed in said stationary tube for telescopic movement in extension and retraction relative thereto, and reversible electric motor operated linear actuator means between said body and said first tube section operative in one mode to drive said first tube section in either one of said extension and said retraction and in another mode to maintain said first tube section in one of an extended positions and a retracted position under a preload against an obstruction to continued movement, the combination comprising, a substantially inelastic polymeric insulator disposed in said aperture including a bore for passage of said first tube section, means defining a moisture tight seal between said insulator and said panel, a substantially inelastic polymeric sleeve on said first tube section movable as a unit therewith, means on one of said insulator and said sleeve defining an annular frustoconical seal shoulder, and means on the other of said insulator and said sleeve defining a circular lip engageable on said seal shoulder in line contact through 360° around said first tube section in said extended position of the latter, said lip and said seal shoulder cooperating to define an obstruction to continued movement of said first tube section beyond said extended position so that said lip and said seal shoulder are maintained in preloaded sealing engagement by said actuator means in said extended position of said first tube section.



4,527,169

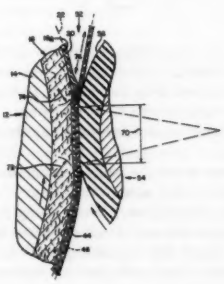
TONER TRANSFER APPARATUS WITH SLIP ACTION

Gilbert D. Springer, Sunnyvale, Calif., assignor to Ferix Corporation, Fremont, Calif.

Filed Mar. 12, 1984, Ser. No. 588,207

Int. Cl.³ G01D *15/12*

U.S. Cl. 346—74.2 **6 Claims**



1. In a toner transfer system of the type usable with a magnetically attractable toner and a toner-adherable receiving

medium transportable along a first known path, toner transfer apparatus comprising

magnetic image-carrier means including support means, resilient backing means, having a surface expanse, mounted on said support means and substantially incompressible, flexible, web-like magnetic image-storage means slidably disposed on and in general conformity with the surface expanse of said backing means for sliding and transporting along a second path a portion of which is disposable adjacent the previously mentioned first path, and

pressure roller means operatively disposable adjacent said first path opposite from said second path when the second path is disposed adjacent the first path, for pressing the receiving medium during travel along the first path against said image-storage means during travel along said second path sufficiently to compress radially said backing means with the resulting change in distance traveled by said image-storage medium in the region of pressured contact being accommodated by a complimentary slip action between said backing means and said image-storage means along said second path.

4,527,170

INK JET WASTE AND REPLENISH INK SYSTEM

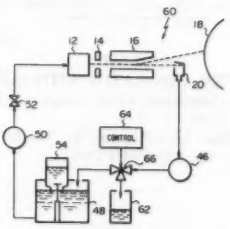
Kyuhachiro Iwasaki, Fujisawa; Minoru Ameyama, Yokohama; Yutaka Ebi, Kawasaki; Koichiro Jinnai, Kawasaki, and Tsutomu Sato, Yokohama, all of Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

Filed May 9, 1983, Ser. No. 492,774

Claims priority, application Japan, Jun. 17, 1982, 57-104638

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **11 Claims**



1. An ink jet printing apparatus including an ink ejection head for ejecting a jet of ink and print control means for causing ink droplets from the ink jet to impinge on a sheet for printing, characterized by comprising:

an ink supply source for supplying the ink to the ink ejection head;

collecting means for collecting ink droplets from the ink jet which are not used for printing;

ink discarding means, the collecting means feeding a predetermined amount of said collected ink to the ink discarding means for discarding and feeding the remaining amount of said collected ink to the ink supply source for reuse; and

means for feeding to the ink supply source an amount of ink equal to the amount of discarded ink.

4,527,171

THERMAL TRANSFER PRINTING EMPLOYING A BINDER

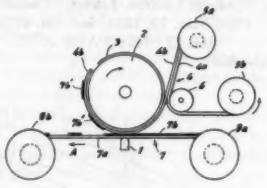
Itsuo Takanashi; Hideshi Tanaka; Hisanori Tsumiyama, all of Yokohama; Yoshio Mizuno, Kamakura; Terumi Ohara, Yokohama; Shigeru Kato, Tokyo; Toshinori Takahashi, Kawasaki, and Tsutomu Kiuchi, Yokohama, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Nov. 21, 1983, Ser. No. 554,023

Claims priority, application Japan, Nov. 22, 1982, 57-203791

Int. Cl.³ G01D *9/00*

U.S. Cl. 346—76 PH **11 Claims**



1. A method for printing an image on a recording sheet positioned on a platen, in response to a video signal, comprising the steps of:

feeding a first transfer sheet having a layer of thermally fusable binder material thereon to contact the recording sheet;

heating the transfer sheet for fusing the binder material to the recording sheet and transferring a coating of binder material to the recording sheet;

feeding a second transfer sheet having a layer of thermally fusable ink thereon to contact the transferred binding material coating;

heating the second transfer sheet thereby fusing the ink to the coating and transferring the ink from the second transfer sheet to said coating.

4,527,172

THERMAL TRANSFER RECORDING APPARATUS

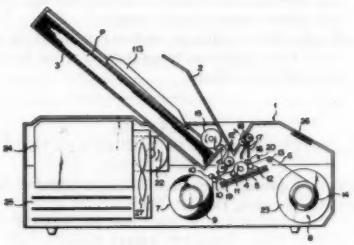
Masayoshi Nagashima, Chigasaki; Hiroshi Yamane, Ebina; Shigeru Kikkawa, Kawasaki, and Yoshinori Teraki, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 13, 1984, Ser. No. 579,641

Claims priority, application Japan, Feb. 14, 1983, 58-22405

Int. Cl.³ G01D *15/10, 15/00;* **B41J** *3/20, 11/58*

U.S. Cl. 346—76 PH **6 Claims**



1. A thermal transfer recording apparatus in which ink on a thermal transfer medium is transferred to an objective material for transfer so that information is recorded on the objective material, and which comprises:

a first unit and a second unit swingably attached thereto, said first unit containing therein holding means holding the

thermal transfer medium and take-up means driven by a drive source to wind the thermal transfer medium from the holding means,

regulating means for regulating the driving timing of the drive source; and

detecting means for detecting that the second unit is set on the first unit and outputting a detection signal,

wherein said regulating means, receiving the detection signal from the detecting means, causes the drive source to actuate the take-up means, whereby the thermal transfer medium is wound for a predetermined length.

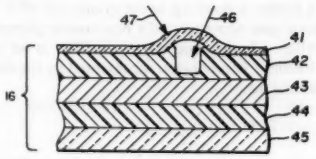
4,527,173
ERASABLE, REUSABLE OPTICAL RECORDING ELEMENT AND METHOD

Mool C. Gupta, W. Webster; Joseph J. Wrobel, Rochester, and Forrest C. Strome, Jr., Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,714

Int. Cl.³ G01D *15/34;* **G11C** *13/04;* **G11B** *7/00;* **G03E** *1/76*

U.S. Cl. 346—135.1 **16 Claims**



1. An erasable, reusable recording element comprising a support having thereon in the following order:

(a) a smoothing layer,

(b) a metal reflection layer, and

(c) a heat-deformable optical recording layer, characterized in that the optical recording layer:

(i) is an amorphous layer of a dye and a binder;

(ii) has an absorption factor of at least about 20 at a first wavelength and substantially transparent at a second wavelength;

(iii) is capable of being thermally deformed by a beam of high energy density radiation of said first wavelength to form a deformation comprising a hole or depression; and

(iv) has a transparent ceramic overcoat having a thickness greater than 0.05 μm up to 0.1 μm.

4,527,174
SHEET PRESSING MECHANISM IN A PEN TYPE RECORDING DEVICE

Mitsugu Fujiwara; Yoshinori Sakaue, both of Morioka; Tomio Aso, Kitakami; Koshiro Kurokawa, Hanamaki, and Hideo Obara, Ezuriko, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

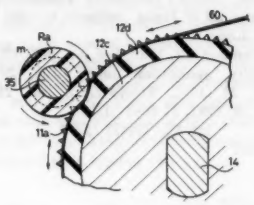
Filed Jun. 23, 1983, Ser. No. 507,179

Claims priority, application Japan, Jun. 24, 1982, 57-94979[U]

Int. Cl.³ G01D *15/24;* **B41J** *11/00;* **B65H** *17/38*

U.S. Cl. 346—136 **4 Claims**

1. A sheet holding mechanism in a pen type recording device including a rotatable platen and a pen adapted to move in the axial direction of the platen while contacting paper held against the platen for forming images on a portion of the paper held against a central portion of the platen, said sheet holding mechanism including pressure rollers brought into pressure contact with outer peripheral surfaces of the end portions of said platen, said pressure rollers being rotatably mounted on a support shaft extending in parallel with the axis of said platen, said outer peripheral surfaces of the end portions of said platen being formed of a material softer than the material forming the central portion of the platen and capable of being indented by the contact pressure of said pressure rollers.



4,527,175
INK SUPPLY SYSTEM FOR NONIMPACT PRINTERS

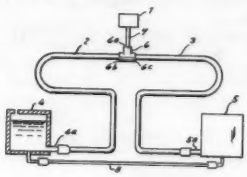
Tamotsu Kojima; Masayoshi Miura, both of Kawasaki, and Gen Oda, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Nov. 30, 1982, Ser. No. 445,836

Claims priority, application Japan, Dec. 2, 1981, 56-194066; Dec. 4, 1981, 56-195921

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **16 Claims**



1. A liquid supply system for a nonimpact printer having a printer head arranged to reciprocate along a scan line, comprising:

first and second liquid containers for holding liquid therein and acting as a pressure absorber for nullifying rapid liquid pressure variations applied thereto when said printer head makes sharp turns at opposite ends of said scan line;

a pair of first and second identical, flexible conduits respectively connected to said first and second liquid containers; and

a T-joint mounted for unitary movement with said printer head, the T-joint having a first passageway connected at one end to said printer head, and a second passageway connected to said first passageway at a point intermediate the length thereof, said second passageway being connected at opposite ends to said first and second flexible conduits respectively, the cross-section of each of said first and second passageways being smaller than the cross-section of said first and second conduits to prevent said pressure variations from being transmitted to said printer head.

4,527,176
MULTI-COLOR PEN RECORDER

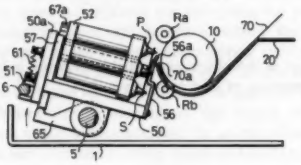
Mitsugu Fujiwara; Yoshinori Sakaue, both of Morioka; Tomio Aso, Kitakami; Koshiro Kurokawa, Hanamaki, and Hideo Obara, Ezuriko, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1983, Ser. No. 507,709

Claims priority, application Japan, Jun. 24, 1982, 57-94978[U]; Jun. 24, 1982, 57-94982[U]; Jun. 28, 1982, 57-96916[U]; Jun. 28, 1982, 57-96917[U]

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—141 **16 Claims**



1. A multi-color pen recorder comprising:

(a) a platen rotatable about its own axis;

(b) a pen carriage mounted on said platen and movable axially therealong;

(c) a pen holder removably mounted on said pen carriage for removably supporting a plurality of pens on said pen holder; and

(d) a hammer mounted on said pen carriage for pushing one of said pens in a position on said pen holder toward said platen.

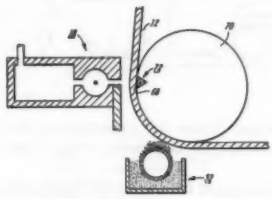
4,527,177
ION PROJECTION PRINTER WITH VIRTUAL BACK ELECTRODE

Gene F. Day, Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1983, Ser. No. 527,712

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—159 **6 Claims**



1. An ion projection printing apparatus for printing on one side of a charge receptor sheet movable in a processing direction and comprising sequentially, in said processing direction, ion projection charging means for delivering imaging ions to said one side of said sheet, development means and fusing means, said charging means and said development means being located on said one side of said receptor sheet, the apparatus being characterized by including

stationary support means against which the other side of said receptor sheet is moved, said support means including a groove therein extending transversely to said processing direction, said groove being located opposite said ion projection charging means, and

virtual back electrode means, comprising bipolar charge creating means, located within said groove, for continuously delivering a countercharge to the other side of said sheet and for accelerating and focussing said imaging ions.

4,527,178
HEAT-SENSITIVE RECORDING PAPER AND FILLER THEREFOR

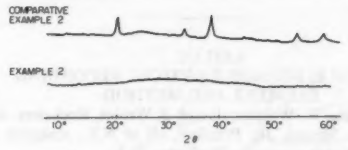
Koichi Usui; Teiji Sato, and Masanori Tanaka, all of Shibata, Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Osaka, Japan

Filed Jan. 23, 1984, Ser. No. 572,999

Claims priority, application Japan, Jan. 21, 1983, 58-7276

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—207 **2 Claims**



1. A heat-sensitive recording paper comprising a paper substrate and a heat-sensitive recording layer formed on the paper substrate, which comprises a composition formed by dispersing in a binder a coloring agent composed of a leuco dye, a color developer composed of a heat-fusible phenol and an inorganic filler, wherein said inorganic filler is an amorphous silicate having a composition represented by the following oxide molecular ratio:

$$MO:SiO_2=0.01:1 \text{ to } 1.1:1$$

wherein M stands for at least one member selected from the group consisting of calcium, barium and zinc, or a product obtained by partially neutralizing said silicate with carbonic acid, said filler having a BET specific surface area of 10 to 70 m^2/g and a bulk density of 0.14 to 0.30 g/cc and also having such a secondary particle size distribution that secondary particles having a size smaller than 4 μm, as determined by the centrifugal precipitation method, occupy at least 70% by weight of the total particles.

4,527,179
NON-SINGLE-CRYSTAL LIGHT EMITTING SEMICONDUCTOR DEVICE

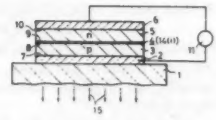
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Feb. 9, 1982, Ser. No. 347,359

Claims priority, application Japan, Feb. 9, 1981, 56-18420; Feb. 13, 1981, 56-19900

Int. Cl.³ H01L *33/00*

U.S. Cl. 357—17 **35 Claims**



1. A light emitting semiconductor device comprising a first non-single-crystal semiconductor layer, a second non-single-

crystal semiconductor layer formed on the first non-single-crystal semiconductor layer, and a third non-single-crystal semiconductor layer; formed on the second non-single-crystal semiconductor layer;

wherein the first and third non-single-crystal semiconductor layers have p and n conductivity types, respectively;

wherein semiconductors of the first, second and third non-single-crystal semiconductor layers are each doped with a dangling bond and recombination center neutralizer; and

wherein the semiconductor of the second non-single-crystal semiconductor layer has a smaller energy gap than the semiconductor of the first and third non-single-crystal semiconductor layers;

4,527,180

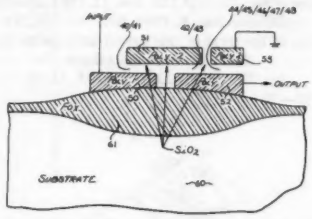
MOS VOLTAGE DIVIDER STRUCTURE SUITABLE FOR HIGHER POTENTIAL FEEDBACK REGULATION

Duane Oto, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 31, 1983, Ser. No. 462,192

Int. Cl.³ H01L *27/04;* **H01G** *4/38;* **H02M** *5/08*

U.S. Cl. 357—23.6 **10 Claims**



1. In a metal-oxide-semiconductor integrated circuit formed on a silicon substrate, a voltage divider comprising:

a first and a second polysilicon member each insulated from said substrate and from each other;

a third and a fourth polysilicon member each insulated from each other and from said first and second polysilicon members;

said third polysilicon member being disposed over a portion of said first and second polysilicon members so as to provide capacitance between said third polysilicon member and said first and second polysilicon members, said third polysilicon member being completely surrounded by insulation;

said fourth polysilicon member being disposed above said second polysilicon member so as to provide capacitance between said second and fourth polysilicon members;

said first, second and fourth members being coupled to terminals for said divider;

whereby said circuit provides a voltage divider between said first and second members.

4,527,181

HIGH DENSITY SEMICONDUCTOR MEMORY ARRAY AND METHOD OF MAKING SAME

Nobuo Sasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 24, 1981, Ser. No. 295,585

Claims priority, application Japan, Aug. 28, 1980, 55-117824

Int. Cl.³ H01L *29/78, 27/02, 27/12, 29/06*

U.S. Cl. 357—23.7 **7 Claims**

1. A semiconductor device, comprising:

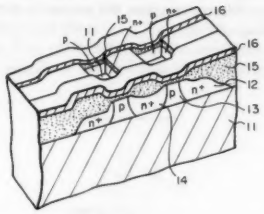
an insulating substrate;

a first semiconductor region of a first conductive type formed on said insulating substrate and comprising a conductive bit line;

A second semiconductor region of the first conductive type formed on said insulating substrate and operatively connected to a power supply;

a third semiconductor region of a second and opposite conductive type formed on said insulating substrate and situated between said first and second semiconductor regions;

an insulating layer formed on said first, second and third semiconductor regions, said insulating layer having first and second thicknesses, said second thickness being thinner than said first thickness, said first thickness being associated with said first and second semiconductor regions, and said second thickness being associated with said third semiconductor region; and



metal wiring comprising a word line formed on said insulating layer, said first and second semiconductor regions being aligned in parallel with each other, said metal wiring being aligned perpendicular to the direction in which said first and second semiconductor regions are aligned and said third semiconductor region being positioned directly under only said metal wiring, thereby providing self-aligned holes adjacent laterally to said third semiconductor region in a direction perpendicular to said metal wiring.

4,527,182

SEMICONDUCTOR PHOTOELECTRIC CONVERTER MAKING EXCESSIVE CHARGES FLOW VERTICALLY

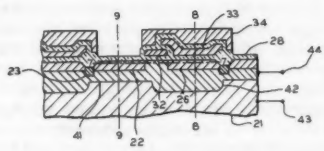
Yasuo Ishihara; Eiji Oda, and Nobukazu Teranishi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 304,301

Claims priority, application Japan, Sep. 19, 1980, 55-130517; Apr. 17, 1981, 56-57998

Int. Cl.³ H01L *29/78*

U.S. Cl. 357—24 **12 Claims**



1. A solid-state photoelectric converter comprising:

a semiconductor substrate of a first conductivity type;

a first semiconductor region of a second conductivity type which is opposite to said first conductivity type formed on said semiconductor substrate, said first semiconductor region having a first portion forming a first PN-junction with said semiconductor substrate and having a first depth and a second portion forming a second PN-junction with said semiconductor substrate and having a second depth which is deeper than said first depth;

a plurality of second semiconductor regions of said first conductivity type formed in said first portion of said first semiconductor region, said second semiconductor regions being aligned in a line, and each of said second semiconductor regions accumulating charges therein in response to incident light;

means for transferring charges along said line of said second semiconductor regions, said transferring means being formed in said second portion of said first semiconductor region;

a charge transfer gate formed upon said first semiconductor region between said second semiconductor region and said transferring means for transferring charges accumulated in said second semiconductor regions to said transferring means;

means for converting charges transferred along said transferring means into an electrical signal; and

means for reverse biasing said first and second PN-junctions to completely deplete said first portion up to said second semiconductor regions but to partly deplete said second portion.

4,527,183

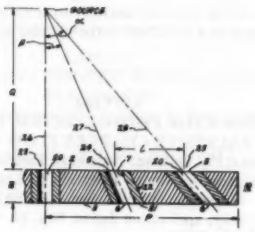
DRILLED, DIFFUSED RADIATION DETECTOR

Thomas R. Anthony, Schenectady; Douglas E. Houston, Liverpool, and James A. Loughran, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 10, 1981, Ser. No. 282,218

Int. Cl.³ H01L *27/14, 29/06*

U.S. Cl. 357—30 **4 Claims**



1. A radiation detector, said detector comprising

(a) a target of single crystal semiconductor material, said target having first and second major opposed substantially parallel surfaces and an outer peripheral edge area interconnecting said major surfaces and a target axis, said target axis passing through the centroid of said target substantially perpendicular to said major surfaces, the distance along said target axis between said major surfaces being the predetermined thickness of said target;

(b) an array of a plurality of diodes therethrough, each said diode comprising, in combination, a high-aspect-ratio hole through the thickness dimension of said target and a semiconducting region of generally uniform cross-section substantially concentric with said hole, each said hole having apertures lying in the planes of said major surfaces, an inner hole surface interconnecting said apertures and a hole axis passing substantially through the center of each aperture, each said hole axis intersecting and forming a predetermined angle with said target axis at a predetermined distance away from said upper surface, each said region having a conductivity type opposite to that of said target and being bounded by the inner surface of said hole and a junction with the material of said target, said junction being substantially concentric with said hole and extending between said major surfaces.

4,527,184

INTEGRATED SEMICONDUCTOR CIRCUITS WITH CONTACT INTERCONNECT LEVELS COMPRISED OF AN ALUMINUM/SILICON ALLOY

Franz Fischer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 530,539

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244461

Int. Cl.³ H01L *23/48*

U.S. Cl. 357—67 **3 Claims**

1. An integrated circuit comprising a silicon substrate and a contact interconnect level, said interconnect level consisting of an aluminum-silicon-titanium alloy containing between about 1 and 2% silicon, and titanium in an amount of about 0.1 to 0.5% by weight.

4,527,185

INTEGRATED CIRCUIT DEVICE AND SUBASSEMBLY

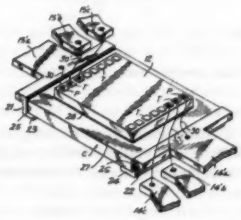
Elliott Philofsky, Myrtle Beach, S.C.; Ward Parkinson, and Dennis Wilson, both of Boise, Id., assignors to AVX Corporation, Great Neck, N.Y.

Continuation of Ser. No. 224,127, Jan. 12, 1981, abandoned. This application Jan. 6, 1984, Ser. No. 568,291

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.³ H01L *23/14, 25/02, 23/48*

U.S. Cl. 357—70 **2 Claims**



1. A integrated circuit device comprising in combination, a mass of polymeric insulating material, a lattice work of metal formed from integral web embedded in said mass, said lattice work including a plurality of conductor member having portions disposed in coplanar alignment within said mass, said conductor members including contact portions extending outwardly of said mass, a pair of said conductor members within said mass having spaced inner terminal ends defining a support platform, said platform including a pair of spaced mounting portions displaced from the plane of said conductor portions, said mounting portions each comprising a first leg member extending generally perpendicularly away from said plane of said conductor portions, and a second leg member extending from said first leg member, said second leg members being disposed in substantially coplanar alignment with each other and in a plane generally parallel to said plane of said conductor portions, a combined capacitor and silicon chip sub-assembly mounted on said platform, said sub-assembly including a capacitor having opposed generally parallel end portions, said end portions including metallic terminations, said capacitor including a upper surface and a lower surface extending between said end portions, a silicon chip member bonded to said upper surface of said capacitor by an adhesive layer intervening between said upper surface and said chip member, said chip member including a plurality of circuit means and a pair of power supply contacts, said sub-assembly being mounted on said platform with each said end portion of said capacitor disposed in abutting relation with a respective one of said first leg members, and said undersurface of said capacitor disposed on said second leg member, said adhesive layer, in said

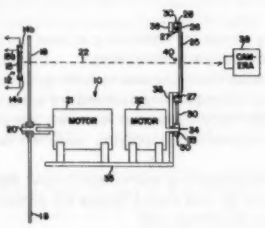
mounted position of said sub-assembly being disposed in substantial alignment with the plane of said conductor members, each said termination of said capacitor being electrically and mechanically connected through a respective one of said mounting portions, a first pair of circuit conductor means displaced from the surface of said capacitor and connecting a respective said mounting portion to a said power supply contact of said chip member whereby said power supply contacts of said chip member are shunted by said capacitor, and additional circuit conductor means displaced from the surface of said capacitor and connecting said circuit means of said chip member with others of said conductor members.

4,527,186

MULTICOLOR LIGHT PATTERN IMAGE FORMING SYSTEM

Louis S. Acker, P.O. Box 81, Chichester, N.Y. 12416

Filed Aug. 6, 1982, Ser. No. 405,940
Int. Cl.³ H04N *9/02*
U.S. Cl. 358—1 **49 Claims**



31. A light pattern image forming system comprising:

intermittent multicolor light source means for generating pulses of multicolor light over an optical path, said intermittent multicolor light source means comprising a plurality of flash tube means arranged in an array, said flash tube means constructed for delivering pulses of light of different color, at least two flash tube means provided for each color distributed over the array for more even pulse lighting over an optical path, said array of flash tube means mounted in stationary position in the image forming system;

mask means spaced from the intermittent multicolor light source means along an optical path, said mask means mounted for rotation about a center of rotation so that the mask means center of rotation falls along an optical path of the multicolor light pulses, said mask means comprising a transmitting pattern formed in opaque masking material with a symmetry relative to the center of rotation, for transmission of multicolor light pulses through the pattern in different rotational positions;

means for rotating said mask means around said center of rotation at selected variable speeds;

and image presentation means aligned in the optical path for recording and/or displaying multicolor light patterns images formed by the system.

4,527,187

HIGH SENSITIVITY FM SIGNAL DEMODULATION SYSTEM

Tomozo Ohta, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Japan

PCT No. PCT/JP81/00207, § 371 Date Aug. 23, 1982, § 102(e) Date Aug. 23, 1982, PCT Pub. No. WO83/00974, PCT Pub. Date Mar. 17, 1983
PCT Filed Aug. 31, 1981, Ser. No. 413,386
Int. Cl.³ H04N *9/50*
U.S. Cl. 358—23 **12 Claims**

1. A high sensitivity FM signal demodulation system comprising:

an input terminal (15) for receiving a television FM signal,

a variable bandpass filter (8) coupled with said input terminal, the center frequency and the bandwidth of said variable bandpass filter being controllable,

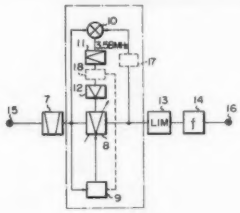
a limiter circuit (13) and a frequency discriminator (14) coupled with the output of said variable bandpass filter,

an output terminal (16) coupled with the output of said frequency discriminator,

a phase detector circuit (10) coupled with the input and the output of said variable bandpass filter (8),

a narrow-band bandpass filter (11) coupled with the output of said phase detector (10) for deriving the color sub-carrier component of a picture signal,

a color sub-carrier adjuster (12), responsive to the output of the narrow bandpass filter (11), for controlling said variable bandpass filter (8) by adjusting the amplitude and the phase of the output of said narrow-band bandpass filter (11),



a level detector (9) for measuring the input signal level of said variable bandpass filter (8) and which is operative to control the bandwidth of said variable bandpass filter (8) according to the measured input signal level,

the bandwidth of said variable bandpass filter (8) being controlled to be wide by the output of said level detector (9) when the input level of said television FM signal is higher than a threshold level (C/N), and said bandwidth of said variable bandpass filter (8) being controlled to be narrow as said television FM signal level decreases, and the center frequency of said variable bandpass filter (8) being controlled by the output of said phase detector (10) so that said center frequency follows to the instantaneous frequency of said color sub-carrier component, and

a signal demodulated by said frequency discriminator (14) being applied to said output terminal (16).

4,527,188

APPARATUS FOR DEMODULATING SAMPLED DATA CHROMA SIGNALS

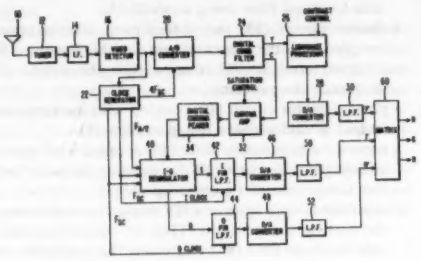
Henry G. Lewis, Jr., Hamilton Square, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 17, 1983, Ser. No. 467,432
Int. Cl.³ H04N *9/50*
U.S. Cl. 358—23 **12 Claims**

1. In a TV receiver having a source of sampled data chrominance signal, said chrominance samples occurring in sequences of interleaved first and second color mixture signals +A, +B, −A, −B, where the ± signs accompanying samples designated with like letters indicate a difference of sampling phase of 180 degrees relative to a color burst reference and samples separated by exactly one horizontal line interval are sampled on opposite phases, a demodulator comprising:

means for selectively demultiplexing samples of a first color mixture signal component sampled at a prescribed sampling phase from every other horizontal line of chrominance signal and demultiplexing and inverting the polarity

of samples of said color mixture signal component sampled at 180 degree phase differences relative to said pre-



scribed sampling phase from the intervening horizontal lines of chrominance signal.

4,527,189

COLOR IMAGE PICKUP DEVICE

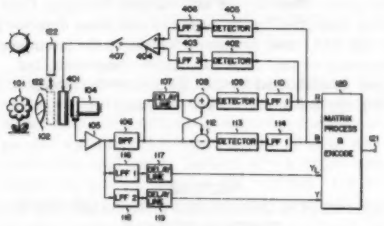
Kazushige Ooi, Sagamihara; Shigekazu Fujiwara, Kamakura; Nobunki Yoshida, Tokyo, and Yoshio Mori, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Nippon Kogaku K.K., Tokyo, both of, Japan

Filed Feb. 18, 1983, Ser. No. 467,883

Claims priority, application Japan, Feb. 22, 1982, 57-26936

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—29 **7 Claims**



1. A color image pickup device comprising:

image pickup means for receiving image light from a white object to be photographed or image light integrated by a diffusion plate through an optical path;

signal separating means for separating two primary color signals from an output video signal from said image pickup means;

detecting means for comparing the two primary color signals from said signal separating means and for producing a detection signal which indicates a difference between the two primary color signals; and

an electrochromic element, disposed on the optical path, a spectral transmittance of which is controlled in accordance with the detection signal, whereby said electrochromic element is controlled to obtain an optimal white balance.

4,527,190

MIXING CIRCUIT

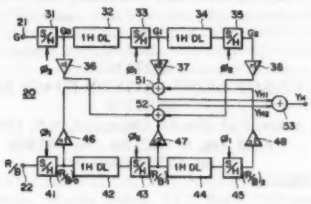
Makoto Onga, Fujisawa; Masatoshi Sase, Atsugi, and Seisuke Yamanaka, Mitaka, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,408

Claims priority, application Japan, Dec. 11, 1981, 56-199858

Int. Cl.³ H04N *9/50*

U.S. Cl. 358—30 **9 Claims**



1. A mixing circuit for combining at least two input signals into a synthesized signal, comprising:

sampling means receiving said at least two input signals for producing corresponding sampled input signals;

switch means receiving said at least two sampled input signals for sequentially supplying said two sampled input signals;

holding means receiving said sampled input signals supplied sequentially by said switch means for producing an additive signal therefrom; and

buffer amplifier means having an input connected to said holding means for producing a buffered added output signal based on said at least two input signals.

4,527,191

DIGITAL SIGNAL PROCESSING CIRCUIT

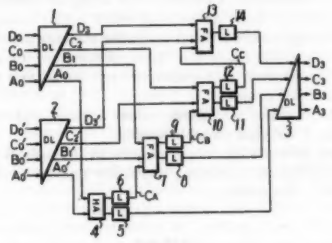
Fumio Nagumo, and Takashi Asaida, both of Atsugi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,053

Claims priority, application Japan, Feb. 10, 1982, 57-19973

Int. Cl.³ H04N *9/539*

U.S. Cl. 358—30 **11 Claims**



1. A digital signal processing circuit for processing at least two digital signals comprising:

(A) a first input terminal supplied with a first digital signal of parallel M bits per one clock interval where M is a positive integer;

(B) a second input terminal supplied with a second digital signal of parallel N bits per one clock where N is a positive integer and may be equal to M;

(C) first delay means for delaying said first digital signal such that, at least, the delay imparted to the most-significant bit (MSB) of said first digital signal is larger than that im-

parted to the least-significant bit (LSB) of said first digital signal by m clock intervals where m is a positive integer;

(D) second delay means for delaying said second digital signal such that, at least, the delay imparted to the MSB of said second digital signal is larger than that imparted to the LSB of said second digital signal by n clock intervals where n is a positive integer;

(E) an adder means for adding M/m+1 bits including the LSB of said first digital signal and N/n+1 bits including the LSB of said second digital signal and for generating output bits and a carry bit, the delay imparted to said M/m+1 bits and N/n+1 bits by said first and second delay means being the same;

(F) L of full adder means where L is a positive integer, each of said full adder means adding bits of said first and second digital signals and a carry bit and generating output bits and a carry bit which are supplied to the succeeding full adder means, the delay imparted to said bits by said first and second delay means being the same, and one of said full adder means generating output MSB and generating at least the output bits; and

(G) third delay means for delaying the output bits of said adder means and full adder means such that the output bits of said third delay means are all in the same original clock interval.

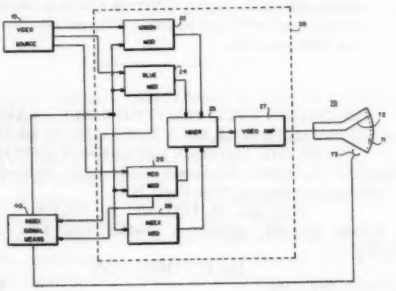
3. A digital signal processing circuit according to claim 1, further comprising other processing circuits including digital adder circuits, latch circuits and selector circuits between said adder means, full adder means and the third delay means or said first, second delay means and adder means, full adder means.

4. A digital signal processing circuit according to claim 3, wherein said first and second digital signals are two digital primary color signals, and further comprising third input terminal supplied with another digital primary color signal which is delayed by fourth delay means and which is processed with said two digital color primary color signals by said adder means, full adder means and other processing circuits, whereby the output of said third delay means being a digital composite color video signal.

4,527,192
INDEX SIGNAL ENHANCEMENT CIRCUIT

Richard W. Midland, Inverness, and Boris Rozansky, Skokie, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 28, 1983, Ser. No. 470,884
Int. Cl.³ H04N *9/24*
U.S. Cl. 358—67 **12 Claims**



1. A color display system comprising:

a color picture tube including an electron beam deflectable across a faceplate bearing a pattern of periodic stripes of different colored light-emitting phosphor with a plurality of special signal generating areas regularly dispersed among the phosphor stripes;

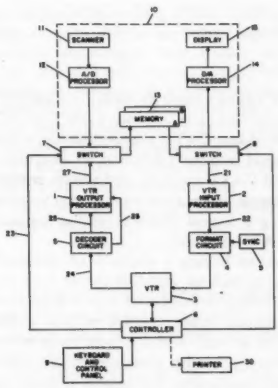
wide-band index signal means, responsive to said electron beam impinging said special signal generating areas, for developing an index signal denoting the relationship between said electron beam and said pattern, said index signal being subject to distortion resulting from said index signal means undesirably responding to electron beam impingement of phosphor stripes in said picture tube adjacent to said index strip; and

correction means in said index signal means for developing a correction signal for compensating said distortion by offsetting the effects of the video drive signals corresponding to said adjacent index strips on said index signal means.

4,527,193
IMAGE STORAGE SYSTEM

Karl M. St. John, Huntington Station, and Dominic V. Zagardo, West Islip, both of N.Y., assignors to Hazeltine Corporation, Commack, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,542
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—76 **4 Claims**



1. An apparatus for use with a separations previewer having a scanner for scanning a separation, an analog-to-digital processor for developing digital signals corresponding to images on the separations, a memory for storing digital information corresponding to the digital signals, a digital-to-analog processor including a color computer for developing adjusted analog information corresponding to the digital information and a display for generating an image from the adjusted analog information, said apparatus comprising:

a. first means associated with the memory of the separations previewer for retrieving digital information stored in the memory and for storing digital information in the memory;

b. a video tape recorder for storing information in a video format on a video tape;

c. third means for converting digital information retrieved by said first means into a format compatible with the video format and for providing said converted digital information to said video tape recorder for storage on the video tape, said third means including means for adding synchronization pulses to the digital information retrieved by said first means;

d. fourth means for converting information stored on the video tape of said video tape recorder into corresponding digital information and for providing said corresponding digital information to said first means for storage in the memory; and

e. fifth means for controlling the operation of said first means and said video tape recorder.

4,527,194

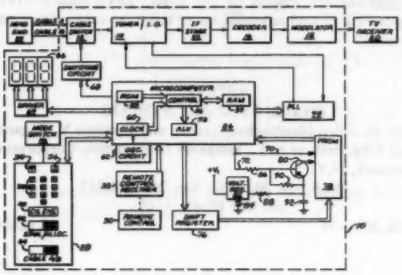
CHANNEL ASSIGNMENT FOR CATV SYSTEM

Semir Sirazi, Chicago, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 27, 1983, Ser. No. 517,876

Int. Cl.[3] H04N 7/10, 5/50

U.S. Cl. 358—86 11 Claims



1. A CATV tuning system for tuning to a plurality of CATV channels transmitted on at least one cable from a CATV head end with each of said CATV channels having a corresponding physical channel number related to an assigned carrier frequency of said CATV channel, said system comprising:

channel selector means responsive to user initiated inputs for generating a logical channel number representing a selected CATV channel;

memory means having a plurality of addressable storage locations in each of which is stored a physical channel number having an associated carrier frequency;

signal processing means coupled to said channel selector means and to said memory means and responsive to a logical channel number generated by said channel selector means for converting said logical channel number to a lock-up address in said memory means, the contents of the memory storage location defined by said look-up address representing a predetermined physical channel number, for reading the contents of said given look-up address therefrom, and for converting the contents of said look-up address to a tuning frequency word associated with said physical channel number; and

tuning circuitry coupled to said signal processing means and responsive to said tuning frequency word for tuning to the carrier frequency of said physical channel number.

9. In a CATV tuning system wherein CATV channels are transmitted from a CATV head end on at least one cable with each CATV channel having associated therewith a physical channel number corresponding to an assigned carrier frequency, a method for tuning said CATV channels comprising:

assigning a logical channel number to each of the transmitted CATV channels;

storing each of said physical channel numbers in a respective addressable location of a memory device;

selecting a logical channel number representing a desired transmitted CATV channel for tuning;

converting the selected logical channel number to a given address of said memory device;

reading the physical channel number stored in the memory location of said memory device defined by said given address; and

generating a tuning frequency corresponding to the physical channel number read from said memory device in tuning to the carrier frequency of the selected CATV channel.

4,527,195

APPARATUS FOR ENCODING AND DECODING INFORMATION

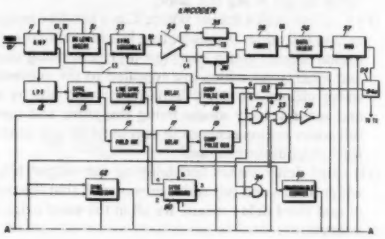
William S. H. Cheung, Hong Kong, Hong Kong, assignor to Payview Limited, Kowloon, Hong Kong

Continuation-in-part of Ser. No. 134,185, Mar. 16, 1980, Pat. No. 4,396,947, and Ser. No. 302,789, Sep. 16, 1981, abandoned. This application Jun. 11, 1982, Ser. No. 387,411

Claims priority, application United Kingdom, Feb. 20, 1979, 7905858

Int. Cl.[3] H04N 7/16; H04K 1/04

U.S. Cl. 358—120 20 Claims



1. An apparatus for scrambling a video signal, said video signal comprising a series of signals each representing lines within a field, each of said series of signals preceded by a line synchronization pulse for positioning a scanning beam in a television receiver comprising:

means for generating a random number N during each of said fields, said random number changing with subsequent fields;

means for producing random synchronization data from said random number, said data occurring coincident with certain of said synchronization pulses at an irregular interval;

means for altering the level of said certain synchronization pulses;

means for polarity inverting a plurality of alternate lines of a field of said video signals, said alternate lines being separated by a non-inverted line, the first of said inverted lines being identified by said random number which changes for subsequent fields; and

means for combining a signal representing said random number with said video signal during a vertical interval thereof, whereby a scrambled video signal containing decoding data, a plurality of alternate inverted lines with randomly modified synchronization pulses is produced, subsequent fields, having different synchronization pulses with altered levels and having a different number of alternate lines inverted.

4,527,196

TELEVISION RECEIVER COMPRISING A VIDEO SIGNAL DETECTOR OF A TYPE WHICH DETECTS WITH THE AID OF A REFERENCE SIGNAL

Paulus J. M. Hovens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 14, 1983, Ser. No. 458,120

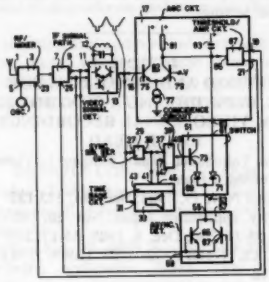
Claims priority, application Netherlands, Feb. 2, 1982, 8200374

Int. Cl.[3] H04N 9/50

U.S. Cl. 358—158 6 Claims

1. A television receiver comprising, coupled to an output of an intermediate frequency signal path, a video signal detector of a type which detects with the aid of a reference signal and, coupled to an output of the intermediate frequency signal path, an asynchronous detector, an automatic gain control circuit being coupled to an output of these detectors and the asynchronous detector being made inoperative in a normal receiving mode, characterized in that said television receiver further

comprises means for decoupling the asynchronous detector from said automatic gain control circuit, said decoupling means having a control input, and a receiving mode detector



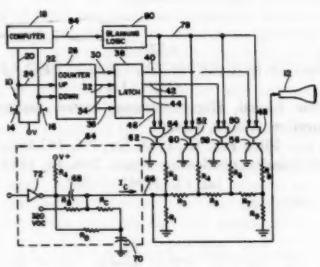
coupled to said video signal detector for detecting said normal receiving mode, said receiving mode detector generating a switching signal which is applied to the control input of said decoupling means.

4,527,197

CATHODE RAY TUBE DIGITAL BRIGHTNESS CONTROL CIRCUIT

David B. Nolte, Prescott, Ariz., assignor to Global Navigation, Inc., Irvine, Calif.

Filed Aug. 27, 1981, Ser. No. 297,028
Int. Cl.³ H04N *5/58*; H01J *29/52*
U.S. Cl. 358—168 **7 Claims**



1. A digital brightness control circuit for use with a cathode ray tube comprising:

a source of brightness control signals operatively connected to a cathode of the cathode ray tube;

a brightness selector circuit;

a counter operatively connected to said brightness selector circuit for generating a digital count signal;

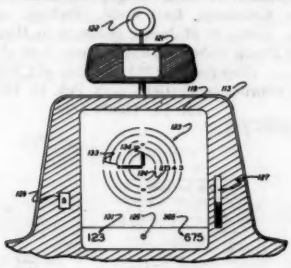
and resistance means including a plurality of resistors operatively connected to said counter to receive said digital count signal and said source of brightness control signals for varying in discrete increments the brightness of the output of the cathode ray tube in response to said digital count signal wherein said plurality of resistors are arranged in a resistive ladder network and wherein said resistance means includes a plurality of switches operatively connected to said resistive ladder network and said counter for selectively connecting said resistors to said source of brightness control signals.

4,527,198

FOLLOWSPOT PARAMETER FEEDBACK

Michael Callahan, 201 W. 85th St., New York, N.Y. 10024

Filed Nov. 19, 1982, Ser. No. 443,127
Int. Cl.³ H04N *5/24, 7/18, 5/30*
U.S. Cl. 358—185 **38 Claims**



1. In a light projector generating a beam suitable for performance lighting; capable of beam parameter adjustment by an attending operator including at least azimuth and elevation adjustment; and provided with an optical sight with a field of view substantially the same as the beam mounted to said projector for aiming it, the improvement comprising:

(a) means for sensing beam azimuth and elevation;

(b) means located at said projector so as to be visible to said operator for displaying in digital form a value corresponding to beam azimuth and elevation; and

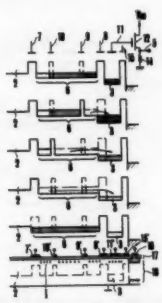
(c) means responsive to said means for sensing for driving said means for displaying.

4,527,199

SOLID STATE IMAGE PICK-UP DEVICE

Takao Kinoshita, Tokyo; Tokuichi Tsunekawa, and Yuichi Sato, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,568
Claims priority, application Japan, Mar. 9, 1981, 56-33558
Int. Cl.³ H04N *3/14, 5/30*
U.S. Cl. 358—213 **13 Claims**



1. A method for transferring an electric charge, comprising:

(a) a step of storing the electrical charge in a first portion;

(b) a step of forming a potential barrier in the first portion to divide the electric charge in the first portion;

(c) a step of introducing and storing the divided electric charge to a second portion in a prescribed repeating cycle; and

(d) a step of introducing the divided electric charge stored in the second portion to a third portion in a cycle different

from the prescribed repeating cycle for the introduction to the second portion.

4,527,200

SOLID STATE IMAGING DEVICE

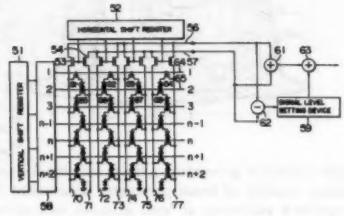
Kenji Takahashi, Kodaira; Shusaku Nagahara, Hachioji; Naoki Ozawa, Kokubunji; Koji Kudo, Hachioji, and Chikafusa Hirano, Tama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha Corp., both of Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,764

Claims priority, application Japan, Feb. 10, 1982, 57-18793

Int. Cl.³ H04N *3/14*

U.S. Cl. 358—213 **4 Claims**



1. A solid state imaging device comprising a solid state image sensor with a plurality of photosensors disposed in two-dimensional matrix whereby signals from two horizontal scanning lines for the solid state image sensor are read out simultaneously, an adder circuit for adding the two-line signals, and a subtractor circuit for subtracting one of the two-line signals from the other, an output signal from the adder circuit being added with an output signal from the subtractor circuit to produce a video signal.

4,527,201

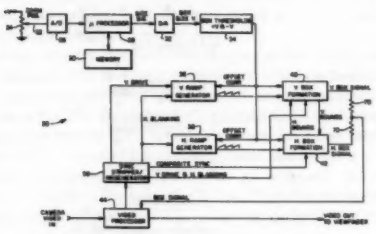
ZOOM INDICATING APPARATUS FOR VIDEO CAMERA OR THE LIKE

Richard D. Cappels, San Jose, Calif., assignor to Panavision, Inc., Tarzana, Calif.

Filed Mar. 29, 1983, Ser. No. 480,065

Int. Cl.³ H04N *5/30*

U.S. Cl. 358—224 **23 Claims**



1. Zoom indicating apparatus for use with an optical system capable of zooming over a predetermined zoom range between a minimum zoom setting corresponding to minimum magnification of an area being viewed by the system and a maximum zoom setting corresponding to maximum magnification of the area, the system providing a zoom signal corresponding to the current zoom setting, and providing a raster display of the area within the field of view of the system at the current zoom setting, the apparatus comprising means responsive to the zoom signal for producing a size signal representative of the magnification at the current zoom setting, means for generating zoom frame signals representative of a zoom frame corresponding to the size signal, and means responsive to the zoom frame signals for superimposing the zoom frame on the raster display so as to indicate a portion of the area that would constitute substantially the entire field of view of the system at said maximum zoom setting.

4,527,202

METHOD AND APPARATUS FOR RECORDING/REPRODUCING A CONTROL SIGNAL ON AND FROM VIDEO SIGNAL RECORDINGS BY AN ERASE HEAD

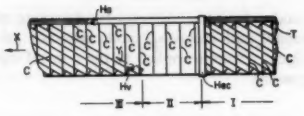
Yoshihiko Ohta, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Nov. 19, 1981, Ser. No. 323,135

Claims priority, application Japan, Nov. 20, 1980, 55-163707; Nov. 26, 1980, 55-166340; Dec. 4, 1980, 55-171359

Int. Cl.³ G11B *5/02, 5/27;* H04N *5/782*

U.S. Cl. 360—18 **16 Claims**



14. A method of using an erase head to record control signals on a magnetic tape together with a video signal having a known frequency range comprising the steps of:

(a) adding a high frequency erasing signal and a control signal having a frequency range outside the frequency range of said video signals;

(b) providing said added erase and control signals to said erase head; and

(c) recording said added signals over substantially the entire width of the magnetic tape thereby erasing any signals previously recorded thereon.

4,527,203

APPARATUS FOR REPRODUCING VIDEO AND AUDIO SIGNALS

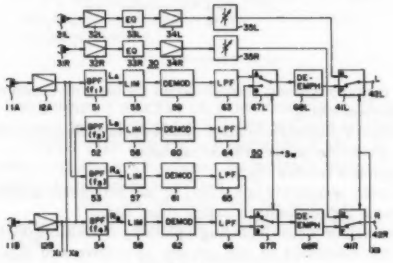
Toshimitsu Kamai, Higashikurume, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,855

Claims priority, application Japan, Feb. 19, 1982, 57-25730

Int. Cl.³ H04N *5/782*

U.S. Cl. 360—19.1 **21 Claims**



1. A video and audio signal reproducing apparatus comprising:

audio signal processing means for reproducing at least one audio recorded in at least one longitudinally disposed track on a magnetic record medium;

mixed signal processing means for reproducing said audio signal from first and second mixed audio and video signals recorded with said audio and video signals in frequency

interleaved relationship in first and second adjacent slant tracks, respectively, on said magnetic record medium;

detecting means for detecting when said audio and video signals are recorded in said frequency interleaved relationship in said slant tracks on said magnetic record medium; and

means for selecting said audio signal from said mixed signal processing means when said audio signal is reproduced thereby and for selecting said audio signal from said audio signal processing means at all other times.

4,527,204

REMOTE CONTROL SYSTEM

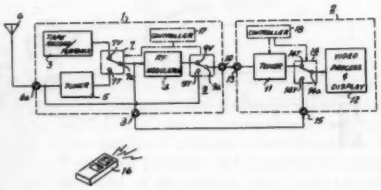
Daisuke Kozakai; Toshio Amano, both of Tokyo, and Kunio Nagai, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 14, 1983, Ser. No. 466,165

Claims priority, application Japan, Feb. 12, 1982, 57-18874[U]; Feb. 12, 1982, 57-18875[U]; Feb. 12, 1982, 57-18876[U]; Feb. 19, 1982, 57-22215[U]

Int. Cl.³ G11B *31/00*; H04N *5/76*

U.S. Cl. 360—33.1 **18 Claims**



1. An apparatus for controlling operation of a video tape recorder and an associated television receiver, comprising:

switch means selectively operable to connect a reproduced video signal from said video tape recorder to an input of said television receiver or to connect an external video signal to said input of said television receiver, said switch means including first and second switch means operably arranged in said video tape recorder and said associated television receiver, respectively;

control means responsive to received command signals for controlling said switch means to connect either said reproduced video signal or said external video signal to said input of said television receiver, said control means including first and second control means, operably arranged in said video tape recorder and said associated television receiver, respectively, for responding to a plurality of different command signals, operation of said first switch means being controlled by said first control means and operation of said second switch means being controlled by said second control means; and

remote control means remotely located from said video tape recorder and associated television receiver and producing said plurality of different command signals in response to which said control means causes said switch means to connect either a reproduced video signal or an external video signal to said input of said television receiver for visual display thereby.

4,527,205

ELECTRONIC CAMERA SYSTEM

Masahiro Konishi, Saitama, Japan, assignor to Fuji Photo Film Company, Ltd., Asaka, Japan

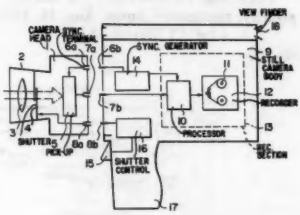
Filed Apr. 13, 1982, Ser. No. 368,017

Claims priority, application Japan, Apr. 13, 1981, 56-55219

Int. Cl.³ H04N *5/76*

U.S. Cl. 360—35.1 **7 Claims**

1. An electronic camera system, comprising: a camera head having a taking lens system for forming an image of an object to be shot, image pickup means for converting an optical image of said object into an electrical signal representing said object, shutter means, and first and second terminals mounted on said camera head and coupled to said image pickup means; a still picture camera body for taking still picture having a recording/controlling section adapted to be connected to the image pickup member to record output signals therefrom on a recording medium as a still picture, said still picture camera body having terminals mounted therein and coupled to said still picture recording/controlling section for mating with said camera head mounted terminals; and a motion picture camera



body for taking a motion picture having a recording/controlling section adapted to be connected to the pickup member to record output signals therefrom on a recording medium as a motion picture, said motion picture camera body having terminals mounted therein and coupled to said motion picture recording/controlling section for mating with said camera head mounted terminals; said camera head being selectively removably mountable on the still picture camera body and the motion picture camera body such that the camera head mounted electrical terminals are in electrical contact with the corresponding terminals on the camera body to which the camera head is mounted.

4,527,206

APPARATUS FOR CONTROLLING BRAKING OPERATION OF A MAGNETIC TAPE TRANSPORT

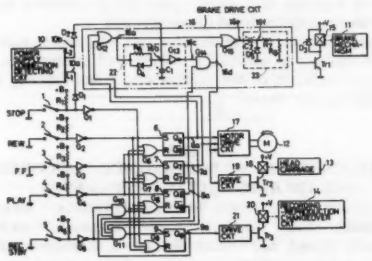
Shigeru Suzuki, and Kazumasu Tsutsumi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 11, 1981, Ser. No. 272,651

Claims priority, application Japan, Jun. 27, 1980, 55-87528; Jun. 27, 1980, 55-87529

Int. Cl.³ G11B *15/18, 15/22*

U.S. Cl. 360—71 **19 Claims**



17. In a tape transport device of the type including a pair of motor driven rotatable reel stands for carrying tape reels and a solenoid-actuated brake mechanism for applying a braking force to at least one of the reel stands, wherein the solenoid is energized during the entire time of application of braking force, the improvement comprising brake drive means for providing a control signal of fixed and constant duration for

enabling power to be supplied to the solenoid for a predetermined limited amount of time whenever braking is to be achieved, wherein the duration of the control signal is sufficient to stop the reel stands.

4,527,207

TAPE SPEED CONTROL FOR PRODUCING A MASTER TAPE CARRYING A DIGITAL SIGNAL

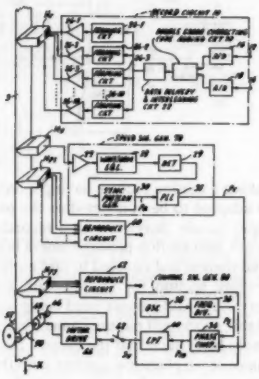
Isao Owaki, Tokyo; Susumu Saito, Sagamihara; Yasuhiko Fujii, Yamato, and Shinji Nakamura, Tokyo, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Aug. 12, 1983, Ser. No. 522,697

Claims priority, application Japan, Aug. 14, 1982, 57-141292

Int. Cl.³ G11B *15/52*

U.S. Cl. 360—73 **12 Claims**



1. Apparatus for producing a master tape, comprising:

(a) tape driving means for driving said master tape;

(b) a multi-track magnetic head and an associated circuit for recording a digital signal on said master tape such that first and second groups of a plurality of tracks are respectively formed when said multi-track magnetic head scans said master tape in first and second directions;

(c) a magnetic head for deriving a signal from one of said first group tracks;

(d) means responsive to said signal from said magnetic head for producing a speed signal indicative of the tape speed at which said digital signal was recorded on said first group tracks in said first direction;

(e) means for producing a control signal by comparing the phase between said speed signal and a reference signal having a predetermined frequency; and

(f) means for controlling the speed of said master tape by controlling said means for driving said master tape, by using the result of the comparison, when forming said second group tracks.

4,527,208

TAPE LOADING DEVICE FOR MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Shin Okita, Atsugi; Hideo Shimizu, Hiratsuka; Noriyuki Yamazaki, Atsugi; Fumio Sekiguchi, Kawasaki; Toshihiko Chimura, Atsugi, and Osamu Shinagawa, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,586

Claims priority, application Japan, Apr. 10, 1981, 56-54681

Int. Cl.³ G11B *5/08*

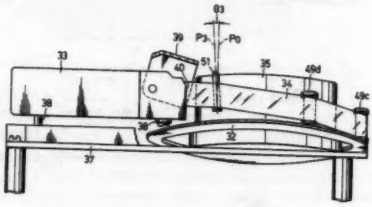
U.S. Cl. 360—85 **19 Claims**

1. In a magnetic recording and/or reproducing apparatus having a cylindrical tape guide drum with at least one rotary magnetic head adapted to move in a circular path substantially coinciding with the outer circumferential surface of said drum, and means for holding a wound supply of magnetic tape apart from said drum with the longitudinal median of the tape lying in a first plane; a tape loading device comprising:

a support member extending around said guide drum and being rotatable in a seocnd plane that is inclined with respect to said first plane;

freely rotatable first tape guide means mounted on said support member and having its axis extending perpendicularly in respect to said second plane in which the support member is rotatable and being responsive to rotation of said support member for withdrawing tape from said wound supply and wrapping a portion thereof about said outer circumferential surface of the tape guide drum, said first tape guiding means engaging said tape such that the longitudinal median of said portion of said tape is substantially parallel to said second plane when said portion of said tape is wrapped about said outer circumferential surface of the tape guide drum;

second tape guiding means movable, in predetermined time relation to said rotation of the support member, from a



first position adjacent said wound supply of tape to a second position spaced from the latter and in which said second tape guiding means engages a run of the tape withdrawn from said wound supply between the latter and said first tape guiding means, said second tape guiding means being in an erect condition substantially perpendicular to said first plane when at said first position thereof and also during a major portion of its movement from said first position to said second position, said second tape guiding means in said second position thereof being displaceable to an inclined condition relative to perpendiculars to said first and second planes, respectively, such that said run of the tape engaged by said second guiding means is deflected by the latter from having its longitudinal median substanitally parallel to said second plane in said wrapped portion to have the longitudinal median of the tape near said wound supply substantially parallel to said first plane; and

means acting on said second tape guiding means at said second position thereof for displacing said second tape guiding means to said inclined condition.

4,527,209

CASSETTE EJECTOR MECHANISM

Arthur T. Martinez, Long Beach, Calif., assignor to T.A.D. Avanti, Inc., Compton, Calif.

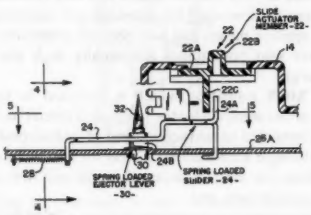
Continuation-in-part of Ser. No. 202,785, Oct. 31, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 383,561

Int. Cl.³ G11B *15/66*

U.S. Cl. 360—96.5 **6 Claims**

1. An ejector mechanism for unloading a cassette from a magnetic tape recorder, said recorder including a chassis having a top deck and a housing enclosing the chassis, and means for mounting a cassette in the magnetic tape recorder in an operative position on the surface of said top deck, said ejector mechanism including: an ejector lever mounted on said chassis and extending through a slot in said top deck for angular movement between an inclined position in which its distal end

is displaced from the surface of said deck to a position in which said distal end is moved against the surface of said deck; first spring means coupled to said chassis and to the other end of said ejector lever for biasing said ejector lever to its inclined position; a slide member mounted on said chassis for reciprocal rectilinear movement along a path displaced from the surface of said deck between a first position and a second position; second spring means coupled to said chassis and to said slide member for biasing said slide member to said first position, said slide member extending across said ejector lever and serving to latch the distal end of said ejector lever against the surface of said deck when said slide member is in its first position and to release said ejector lever to its inclined position when said slide member is moved to its second position, and said ejector lever



serving to latch said slide member in its second position when said ejector lever is released to its incliend position, said ejector lever being positioned to engage the cassette so as to eject the cassette from the surface of said deck when the ejector lever is released to its inclined position, and to enable the cassette to move the distal end of the ejector lever back towards the surface of said deck to be latched by said slide member when the cassette is manually inserted into the tape recorder and moved towards the surface of said top deck; and a slide actuating member movably mounted on said housing having a portion in position to engage said slide member to move the slide member from its first position to its second position so as to release said ejector lever to its inclined position when said slide actuating member is operated.

4,527,210

MODE SELECTING MECHANISM FOR MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS

Ryoji Takamatsu, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 17, 1982, Ser. No. 378,896

Claims priority, application Japan, May 25, 1981, 56-78860

Int. Cl.³ G11B *15/18, 19/02*

U.S. Cl. 360—105 **25 Claims**

1. A mode selecting mechanism for a magnetic tape recording and/or reproducing apparatus comprising:

a chassis;

rotary means mounted on said chassis for turning between a first position and second positions;

a control motor operable for turning said rotary means and thereby changing the mode of the apparatus;

a head base carrying magnetic head means and being slidably mounted on said chassis for movement between inoperative and operative positions;

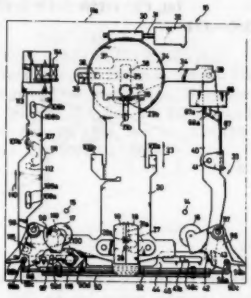
first spring means acting on said head base for urging the latter to one of said positions thereof;

coupling means connected with said head base and being urged against said rotary means by said first spring means acting on said head base so that turning of said rotary means by said control motor is adapted to cause movement of said head base between said positions thereof;

capstan means rotatably mounted on said chassis;

pinch roller support means carrying pinch roller means and being mounted on said chassis for movements between inoperative and operative positions in respect to said capstan means; and

connecting means engaging said rotary means and said pinch roller supporting means and including relatively movable connecting elements and second spring means interposed between said connecting elements and through which said pinch roller means is urged to said operative position against said capstan means with a predetermined pressure



between said pinch roller means and said capstan means when said rotary means is turned by said control motor for disposing said head base in said operative position of the latter;

the forces of said first and second spring means, respectively, acting through said coupling means and said connecting means, respectively, on said rotary means for urging the latter in opposite rotary directions, respectively, during said turning of the rotary means by said control motor.

4,527,211

DEVICE FOR POSITIONING A SCANNING HEAD IN A DRIVE UNIT FOR DISK RECORDS

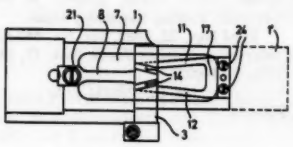
Ernst-Juergen Grittmann, Ludwigshafen; Hans-Joachim Weis, Mannheim, and Klaus Manzke, Westheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 598,997

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1983, 8311053[U]

Int. Cl.³ G11B *5/56, 5/54, 5/55, 21/24*

U.S. Cl. 360—109 **8 Claims**



1. A device for positioning at least one scanning head in a drive unit for disk records, particularly for positioning at least one magnetic head in a drive unit for rigid or flexible magnetic disks, in which the scanning head is mounted on a carriage, and a flexible drive band having essentially the shape of a two-pronged fork is wound around a cylindrical member that can be rotated by a drive motor, and is fastened at either end to the carriage, the narrow end portion running between the two prong-like end portions, so that, when the cylindrical member is rotated, the end portions are wound onto and off said member, thereby causing the carriage, bearing the scanning head, to move in the longitudinal direction, radially with respect to the disk record, wherein the flexible drive band is essentially Y-shaped, each divergent arm portion of the Y forming the same

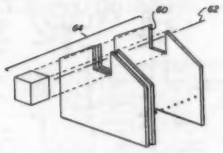
angle with the central longitudinal axis of the band, and having essentially the same width.

4,527,212

MAGNETIC SHIELD AND MULTITRACK MAGNETIC HEAD APPARATUS USING SAME

John D. Ricards, Del Mar, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 1, 1982, Ser. No. 364,171
Int. Cl.³ G11B *5/10, 5/12*
U.S. Cl. 360—121 **2 Claims**



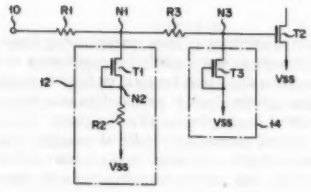
1. A long life multitrack magnetic head comprising
(a) bracket assembly means having slots therein,
(b) magnetic core means in respective slots of a first grouping of said slots,
(c) magnetic shields in respective slots of a second grouping of said slots,
said core means and shields being supported in their respective slots in such a way that said shields and core means have coextensive surfaces adapted to contact simultaneously a magnetic recording medium cooperative with said head, said core means and said shields being of similar thickness, each said shield being respectively comprised of
(a) a stack of laminations of magnetically and mechanically soft material, said laminations being provided with respective cutouts which are similarly respectively disposed so as to form a channel in said stack thereof, and
(b) a chip of magnetically soft but mechanically hard material bonded to said stack of laminations within said channel, the thickness of said stack of laminations and the width of said chip being substantially the same.

4,527,213

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH CIRCUITS FOR PROTECTING AN INPUT SECTION AGAINST AN EXTERNAL SURGE

Shoji Arilzumi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 22, 1982, Ser. No. 443,629
Claims priority, application Japan, Nov. 27, 1981, 56-190124; Nov. 27, 1981, 56-190125
Int. Cl.³ H02H *3/20*
U.S. Cl. 361—56 **6 Claims**



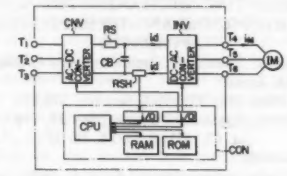
1. A semiconductor integrated circuit device comprising:
an input terminal;
a reference voltage source;
a first resistor means having first and second ends and connected at said first end of said first resistor means to said input terminal to which an input surge is supplied;
a first protective means connected between said second end of said first resistor means and said reference voltage source for accelerating discharge of an input surge, said first protective circuit including a first short channel MOS transistor which is punched through by the input surge and a resistor element connected in series to the source-drain path of said first MOS transistor which has a gate connected to the source thereof;
a second resistor means having first and second ends and connected at said first end of said second resistor means to said second end of said first resistor means;
a second protective means connected between said second end of said second resistor means and said reference voltage source for lowering the potential at a junction of said second resistor means and said second protection means, whenever said potential is abnormally high due to the input surge;
a second MOS transistor which is included in the input section of the semiconductor integrated circuit and whose gate is connected to said second end of said second resistor means through a connecting means for receiving an input signal from the input terminal through said first and second resistor means; and
said second protective means comprising a third MOS transistor, the gate thereof being connected to said reference voltage source.

4,527,214

POWER INVERTER WITH OVERLOAD PROTECTION APPARATUS

Motonobu Hattori, Funabashi; Akira Ishibashi, Tokyo; Hiromi Ishida, Chiba, and Kenji Nandoh, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 1, 1983, Ser. No. 481,150
Claims priority, application Japan, Apr. 2, 1982, 57-53824
Int. Cl.³ H02H *7/122, 5/04*
U.S. Cl. 361—96 **12 Claims**



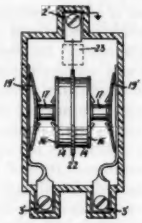
1. A power inverter including a converter unit for converting AC power into DC power, an inverter unit for converting the DC power into AC power, and an overload protection apparatus which comprises current detecting means for detecting a current supplied to an electric motor connected to said power inverter; memory means for storing therein thermally limited operation time characteristic values which are previously determined in consideration of a cooling effect for said electric motor which changes in accordance with the operation speed of said electric motor connected to said power inverter; and abnormality detecting means for producing an abnormality signal to stop operation of said inverter unit or said converter unit when an accumulated value arithmetically determined on the basis of values of the current detected by said current detecting means periodically at a predetermined interval exceeds a corresponding one of said values stored in said memory means.

4,527,215

VALVE TYPE VOLTAGE ARRESTER DEVICE

Egon Wessing, Münster, Fed. Rep. of Germany, assignor to Wickmann-Werke GmbH, Witten-Annen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 246,416, Mar. 23, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,476
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 8025215[U]; Dec. 24, 1980, 3049094[U]
Int. Cl.³ H02H 9/06
U.S. Cl. 361—124 7 Claims



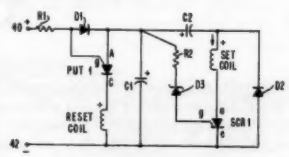
1. A valve type arrester device including two terminals, a switching device, a varistor and two electrodes, all being connected in series, said two electrodes defining between them a gap, said switching device including a first switch member arranged in heat conducting relationship with said varistor, a second switch member connected to said first switch member, fusible material connecting said first and second switch members and biasing means urging said first switch member and said second switch member apart, said arrester device further including a fusible electrical link connected to said first and second switch members in parallel with said fusible material whereby, in use, when said electrodes have become continuously conductive by virtue of fusion or welding said first switch member is so heated by said varistor that said fusible material melts and said biasing means urges said first and second switch members apart whereby said current then flows only through said fusible electrical link thereby melting said fusible electrical link and switching off said current.

4,527,216

SUB-MILLIAMP MECHANICAL RELAY CONTROL

Thomas E. Stammely, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1983, Ser. No. 475,780
Int. Cl.³ H01H 47/32
U.S. Cl. 361—156 23 Claims



1. A control circuit suitable for driving the set and the reset energization coils of a bistable relay comprising:

a first circuit means disposed in parallel with the set and reset coils; said first circuit means being operable for setting a first reference voltage level;

at least one storage means coupled to the first circuit means and the set and reset coils, said first storage means being operable for storing a predetermined electrical charge with sufficient magnitude for setting and resetting the bistable relay;

a first switching means coupled to the set energization coil and the storage means; said first switching means being operable for causing the storage means to discharge a portion of its charge into the set energization coil to set the relay into a first state; and

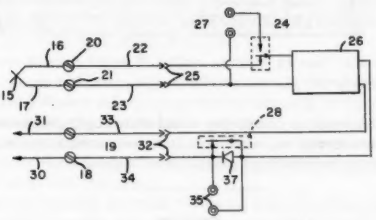
a second switching means coupled to the storage means and the reset coil; said second switching means being operable for causing the storage means to discharge the remaining portion of its charge into the reset coil to reset the relay into a second state.

4,527,217

INSTRUMENT PROTECTIVE DEVICE

Otto Muller-Girard, Rochester, and Philip P. Schulp, Pittsford, both of N.Y., assignors to Transmation, Inc., Rochester, N.Y.

Continuation of Ser. No. 469,313, Feb. 24, 1983, abandoned. This application Sep. 25, 1984, Ser. No. 654,519
Int. Cl.³ H01R 13/44
U.S. Cl. 361—179 9 Claims



1. An on-line quick calibration system for an electrical instrument having

(a) at least one signal path connected to the circuit of the instrument,

(b) two further signal paths connectable to said at least one signal path,

(c) magnetic reed switch means for normally connecting one of said further signal paths to said at least one signal path and simultaneously open circuiting the other of said further signal paths from the at least one signal path, and

(d) control means including magnetic means associated with said magnetic reed switch means for altering the state of said switch means to disconnect said one of said further signal paths from said at least one signal path and to connect the other of said further signal paths to the at least one signal path,

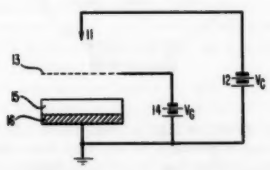
(e) each of said signal paths being provided by a pair of conductors.

4,527,218

STABLE POSITIVELY CHARGED TEFLON ELECTRETS

Heinz von Seggern, Peine-Schwicheldt, Fed. Rep. of Germany, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 8, 1981, Ser. No. 271,671
Int. Cl.³ H01S 4/00
U.S. Cl. 361—233 11 Claims



1. A method of making an article CHARACTERIZED by injecting positive charges into at least a portion of a material

selected from the group consisting of polyfluoroethylenepropylene and polytetrafluoroethylene,

wherein said material is at an elevated temperature during said injecting, thereby obtaining an increase in charge stability of the injected positive charges residing in an internal portion of said material at a depth greater than 4 micrometers from the surface of said material.

4,527,219

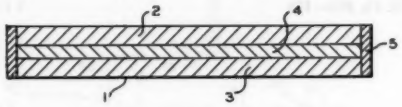
POLY(ARYLENE SULFIDE) ELECTRICAL COMPONENT

Timothy W. Johnson, and Mark L. Stone, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 19, 1983, Ser. No. 543,580

Int. Cl.³ H01G *4/08*

U.S. Cl. 361—323 **24 Claims**



1. A capacitor comprising a dielectric region between two conductive regions, said dielectric and conductive regions consisting essentially of poly(arylene sulfide).

4,527,220

MULTIPHASE SWITCHGEAR FOR HIGH VOLTAGES

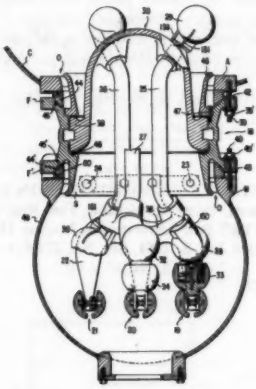
Rintje Boersma, Harmelen; Marius F. F. van Wijnandsbergen, Breukelen; Gijsbert W. Irik, Bilthoven, and Pieter Mariën, De Meeren, all of Netherlands, assignors to Coq B.V., Utrecht, Netherlands

Continuation of Ser. No. 52,309, Jun. 26, 1979, abandoned, which is a continuation of Ser. No. 886,460, Mar. 14, 1978, abandoned. This application Jun. 25, 1984, Ser. No. 623,544

Claims priority, application Netherlands, Apr. 19, 1977, 7704275

Int. Cl.³ H02B *13/00*

U.S. Cl. 361—332 **13 Claims**



7. In a multiphase, a high voltage electrical distribution system including a plurality of bus bars and tubular casing means enclosing said bus bars in gas tight fashion for retaining an insulating gas under pressure, and at least one electrical component including a plurality of conductors and second casing means enclosing said conductors in gas tight fashion for retaining an insulating gas under pressure, the improvement wherein:

said bus bars are provided with a group of stationary contacts and the conductors of said component are provided with a group of stationary contacts, the contacts of each group being disposed in essentially the same spatial pattern, said tubular casing means having an access opening exposing that group of said stationary contacts connected to said bus bars and said second casing means having an access opening exposing said group of stationary contacts on said conductors;

coupling means joining said tubular casing means to said second casing means at said access openings for maintaining the gas tight enclosures of said casing means while establishing electrical contact between said group of stationary contacts on said bus bars and said group of stationary contacts on said conductors through the access opening of said tubular casing means and the access opening of said second casing means, said coupling means including a plurality of further conductors having further groups of contacts at the opposite ends thereof, the contacts of said further groups being individually adjustable on said further conductors so as to match the spatial pattern of the stationary contacts with which they are engaged, the contacts of said coupling means being rotatably mounted on the ends of their respective conductors whereby to match the spatial pattern of the stationary contacts with which they are engaged.

4,527,221

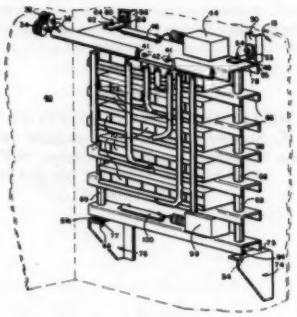
SUPPORT ASSEMBLY FOR A HIGH VOLTAGE DC POWER SUPPLY

James P. Seitz, Burlington, and Rodger A. Zara, Mt. Holly, both of N.J., assignors to NWL Transformers, Bordentown, N.J.

Filed Sep. 27, 1983, Ser. No. 536,193

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—379 **11 Claims**



1. In a high voltage DC power supply having a transformer and other electrical components housed within a tank containing fluid having at least one cover and one side wall with the transformer rigidly secured to the tank, an insulated support assembly detachably mounted in the tank comprising:

a plurality of electrically insulated horizontal struts of substantially equal width forming a ladder arrangement carrying at least a major portion of said other electrical components;

a plurality of electrically insulated vertical supports rigidly supporting each of said horizontal struts;

elongated members extending through respective vertical supports for detachably securing together the struts and vertical supports into a unitary detachable rigid support structure,

support structure means including shelf means removably secured to said elongated members and detachably secur-

ing said support assembly interiorly of said tank and away from said side wall whereby said support assembly is isolated electrically from the tank; and

electrical coupling means detachably and electrically connecting said transformer to said other electrical components.

4,527,222

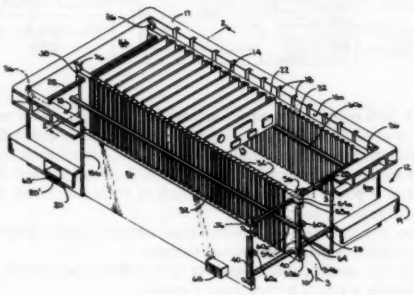
PRECISION TOTE BOX INSERT FOR HOLDING AND LOCATING PRINTED CIRCUIT BOARDS OR THE LIKE

Harold E. Swingley, Jr., Monona, Wis., assignor to Menasha Corporation, Neenah, **HOLDING AND LOCATING PRINTED CIRCUIT BOARDS OR THE LIKE** 3 01171985 55 07021985 ZZX None 20 1 1 Kucia; R. R. 3 7 17

Filed Feb. 24, 1983, Ser. No. 469,506

Int. Cl.[3] **H05K** *1/18*

U.S. Cl. 361—415 **20 Claims**



1. In combination with a tote box, insert for precisely locating and holding printed circuit boards, said insert comprising:

a frame receivable within the box to be freely carried therein for holding and storing printed circuit boards; and

at least one locating element on the frame extending through the tote box in an unsecured manner so as to be exposed relative to the tote box, said locating element being constructed and arranged to provide for direct engagement by an external work station apparatus.

4,527,223

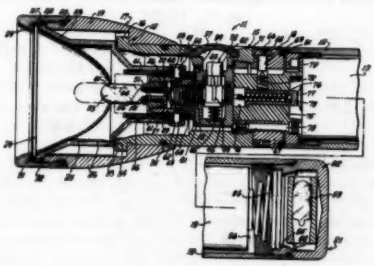
FLASHLIGHT

Anthony Maglica, Ontario, Calif., assignor to Mag Instrument, Inc., Ontario, Calif.

Filed May 18, 1984, Ser. No. 611,892

Int. Cl.[3] **F21L** *7/00;* **F21V** *23/04*

U.S. Cl. 362—187 **11 Claims**



1. A flashlight comprising:

a generally cylindrical switch housing having a longitudinal axis, a forward end portion, a central portion, and a rear end portion;

a head casing member, rotatably secured on the forward end portion of the switch casing;

a lens cap, retaining a lens, said lens cap being threadably coupled to said head casing;

a reflector support abutting said lens and held between said lens and said head casing, said reflector support having a generally tubular double cam structure extending rearwardly from said lens cap and terminating in a rear double cam edge which lies substantially in a pair of planes which are each inclined relative to the longitudinal axis of the reflector support by equal and opposing angles;

a reflector attached to the reflector support and having a central opening adapted to receive a light bulb therethrough, said reflector having a reflecting surface extending axially forwardly and radially outwardly from said opening;

a guide cylinder mounted within said switch casing;

means for locating a pair of axially extending guide slots formed in a portion of said guide cylinder;

a slider element slidably disposed in said guide cylinder for axial movement relative thereto and having a bulb holder and a light bulb attached thereto;

a pair of cam follower rollers secured to said bulb slider element and extending radially outwardly therefrom, said cam follower rollers being slidably disposed in the axially extending slots in said guide cylinder so as to permit axial sliding movement of said cam follower rollers and bulb slider element together with said light bulb member relative to said cylinder;

a switch member mounted within the central portion of said switch housing and electrically connected to said slider element and to said cylinder, respectively, in order to provide an appropriate electrical circuit;

a battery housing casing, capable of enclosing a plurality of standard dry cell batteries, connected to the rear of said switch housing, wherein said battery housing casing is electrically coupled to said guide cylinder and a central terminal of one of said plurality of dry cell batteries is electrically coupled to said switch member; and

an end cap retaining said plurality of dry cell batteries, disposed in a series arrangement, within said battery housing casing, said end cap providing an electrical coupling between said battery housing casing and a bottom electrical terminal of a rearmost one of said plurality of dry cell batteries.

4,527,224

MOUNTING FOR HIGH INTENSITY LIGHT FIXTURE

Richard Sangiamo, Roselle, and Thomas Russello, Elizabeth, both of N.J., assignors to Keene Corporation, Union, N.J.

Filed Jun. 25, 1984, Ser. No. 624059

Int. Cl.[3] **F21V** *17/02, 19/02*

U.S. Cl. 362—282 **8 Claims**

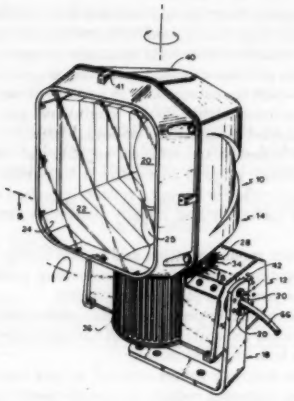
1. An improved high intensity light fixture comprising:

a ballast housing having a top wall, a lamp socket extending upwardly from said top wall, and an upwardly extending collar surrounding said socket;

a reflector housing positioned on said ballast housing for rotation and having a front face, a bottom wall, an opening in said bottom wall sufficient to pass said socket and a downwardly extending collar surrounding said opening;

said ballast housing collar and said reflector housing collar being concentric with each other and defining a joint therebetween which permits one of said housings to be rotated with respect to the other of said housings;

indexing means on one of said housings adjacent said joint; and,



aligning means on the other of said housings whereby the front face of said reflector housing may be precisely oriented with respect to said ballast housing.

4,527,225

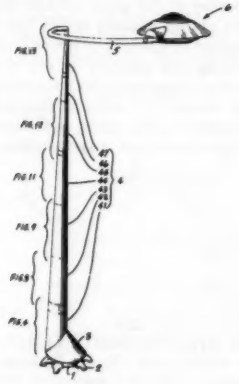
LAMP AND SUPPORT THEREFOR

Cedric Hartman, P.O. Box 3842, Omaha, Nebr. 68103

Filed Dec. 21, 1983, Ser. No. 563,923

Int. Cl.³ F21V *29/00*

U.S. Cl. 362—294 **26 Claims**



14. Illuminating apparatus, comprising:

a. an electric lamp;

b. support means for the lamp;

c. an upper light directing member above the lamp and supported by said supporting means;

d. a lower light directing member below the lamp and supported by said supporting means;

e. means pivotally connecting one of the light directing members to the supporting means;

f. means fixedly connecting the other light directing member to the support means;

g. means latching the two light directing members together, said pivotally connecting means being operable when the latching means is released to separate the two light directing members to permit removal and replacement of the lamp.

4,527,226

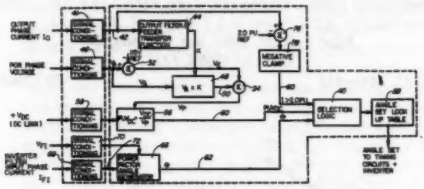
INVERTER CONTROL SYSTEM FOR PROVIDING AN EASILY FILTERED OUTPUT

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 2, 1983, Ser. No. 547,785

Int. Cl.³ H02M *1/12*

U.S. Cl. 363—41 **16 Claims**



11. In a control system for an inverter having a power supply to provide a DC bus voltage, the inverter being controlled in accordance with an angle set to provide a waveform coupled to the input of a filter having an AC output applied to a load at a point, the voltage at which is to be regulated, the improvement comprising:

means for sensing the current at the output of said filter to provide a signal proportional thereto;

means for sensing the voltage at said point of regulation to provide a signal proportional thereto;

means responsive to said filter output current signal and said point of regulation voltage signal for normalizing said DC bus voltage;

means for determining the power factor angle of the input to the filter;

means for storing a plurality of angle sets defining waveforms to be provided by said inverter; and

means for selecting an angle set from said storage means in response to said normalized DC bus voltage and power factor angle to minimize the harmonics of said waveform and to compensate for voltage drops occurring between the DC power supply and the point of regulation.

4,527,227

FALSE RECOVERY DETECTION CIRCUIT FOR PARALLEL OR SERIAL STRINGS OF THYRISTORS

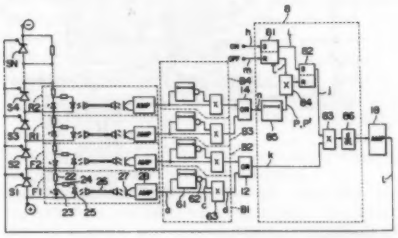
Shoichiro Koseki, Ishioka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 13, 1983, Ser. No. 513,315

Claims priority, application Japan, Jul. 15, 1982, 57-122054

Int. Cl.³ H02H *7/12*

U.S. Cl. 363—54 **8 Claims**



1. In a thyristor converter control system comprising a serial connection of a plurality of thyristors, at least two voltage

detectors for detecting a voltage applied to said thyristors, and a firing circuit for providing firing signals for said thyristors, wherein a logical sum of outputs of said voltage detectors is used as one of the operational conditions of said firing circuit, the improvement comprising the provision of a detector output suppressing circuit means provided at the output of each of said voltage detectors, said detector output suppressing circuit means detecting an erroneous output of said voltage detector when said detector provides an erroneous voltage-presence signal rather than a correct voltage-absence signal, said detector output suppressing circuit means cutting off the output of said voltage detector upon detecting said erroneous output from said voltage detector.

4,527,228

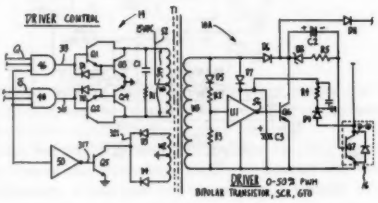
WIDE BAND FULL DUTY CYCLE ISOLATED TRANSFORMER DRIVER

Simon S. Chi Yu, 4090 Whittle Ave., Oakland, Calif. 94602

Filed Sep. 19, 1983, Ser. No. 533,752

Int. Cl.³ H02P *13/20*

U.S. Cl. 363—98 **13 Claims**



1. A driver stage comprising:

a. means for detecting a low point in a signal;

b. means for generating a pulse width modulated signal having a series of peaks and low points at a first voltage;

c. means for transforming said pulse width modulated signal to a second voltage;

d. means for rectifying said transformed signal, said rectified transformed signal serving as an input to said means for detecting a low point in a signal;

e. a solid state switch being placed across a voltage source;

f. a diode having an output into said solid state switch, said transformed signal serving as an input to said diode such that said peaks of said transformed rectified signal turns on said solid state switch;

g. means for delivering a turn-off signal to said solid state switch, said means for delivering said turn-off signal being determined by the output of said means for detecting a low point in a signal relative to said low points of said transformed rectified signal input.

4,527,229

FLYBACK TRANSFORMER WITH HIGH VOLTAGE VARIABLE RESISTOR BUILT THEREIN

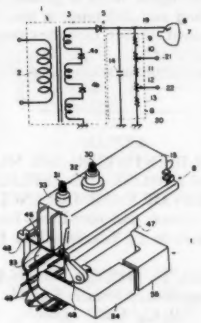
Eiji Imamura, Nonoichi, and Toshio Shoji, Nagaokakyo, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 19, 1983, Ser. No. 533,547

Int. Cl.³ H02M *7/06*

U.S. Cl. 363—126 **11 Claims**

1. A flyback power supply comprising: flyback transformer means having primary and secondary windings, high voltage variable resistor means having resistor elements connected between a high voltage side of said flyback transformer means and a ground thereof, a high voltage capacitor for compensating the capacity of a cathode ray tube connected between the high voltage side of said flyback transformer means and said ground, insulating case means for housing said primary and secondary windings and said resistor elements, and insulating resin means which are injected into said insulating case means, said high voltage capacitor being located in said insulating case means and being arranged between said secondary winding and said resistor elements, said capacitor having first and second electrodes having, respectively, first and second electrode surfaces which intersect the region located between said secondary winding and said resistor elements.



4,527,230

METHOD OF CONTROLLING A SET POINT

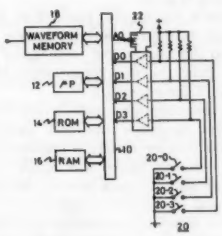
Keiichi Sato; Yoko Takeuchi, both of Tokyo, and Midori Yanagisawa, Ibaragi, all of Japan, assignors to Sony/Tektronix Corporation, Tokyo, Japan

Filed Jul. 29, 1983, Ser. No. 518,581

Claims priority, application Japan, Aug. 18, 1982, 57-143081

Int. Cl.³ G06F *3/03, 15/20*

U.S. Cl. 364—130 **3 Claims**



1. In a method of controlling a set point with a rotary switch for generating sequentially a predetermined number of different digital words by a single rotation thereof, each of said digital words corresponding to zero or a positive number less than said predetermined number, the method comprising the steps of:

periodically detecting digital words from said rotary switch;

comparing a newly-detected first digital word with a previously-detected second digital word and obtaining the difference therebetween;

obtaining a change value according to the difference between said first digital word and said second digital word under any one of the following four conditions:

(1) when the first digital word is less than the second digital word, and said difference is less than one-half of said predetermined number, then the change value is equal to the negative of said difference;

(2) when the first digital word is less than the second digital word, and said difference is greater than one-half of said predetermined number, then the change value is equal to said predetermined number minus said difference;

(3) when the first digital word is greater than the second digital word, and said difference is greater than one-half of said predetermined number, then the change value is equal to said difference minus said predetermined number;

(4) when the first digital word is greater than the second digital word, and said difference is less than one-half of said predetermined number, then the change value is equal to said difference; and

controlling the set point in accordance with said obtained change value.

4,527,231

METHOD FOR IDENTIFYING THE MODEL OF A THERMAL ENCLOSURE AND APPLICATION TO REGULATION OF THERMAL ENCLOSURE

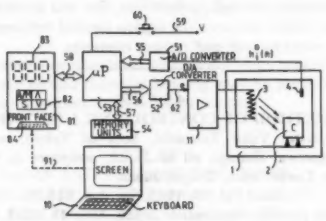
Jean-Claude Aucel, Grasse, and Jean-Louis Testud, Paris, both of France, assignors to La Telemecanique Electrique, Nanterre, France

Filed Sep. 10, 1982, Ser. No. 416,444

Claims priority, application France, Sep. 11, 1981, 81 17533

Int. Cl.³ G05B *13/04*

U.S. Cl. 364—149 **9 Claims**



1. Method for identifying the model of an enclosure comprising the following steps:

applying a power rectangular wave front to the enclosure,

measuring and recording the temperature response of the enclosure to the said power rectangular wave front and computing from the said temperature response, the response time of the enclosure,

generating an identification signal formed of a multiplicity of square waves having a randomly variable height, said square waves further having a randomly variable width comprised between lower and upper limits which are related to the said response time of the enclosure,

applying the said identification signal to the enclosure, and measuring by sampling to obtain a plurality of successive samples each having a corresponding rank number, calculating and storing the pulsed response of the enclosure to each of the said square waves,

calculating the model representing the enclosure from the stored pulsed responses.

4,527,232

HIGH-SPEED MEMORY AND MEMORY MANAGEMENT SYSTEM

Andreas V. Bechtolsheim, Stanford, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jul. 2, 1982, Ser. No. 394,555

Int. Cl.³ G06F *9/34*

U.S. Cl. 364—200 **5 Claims**

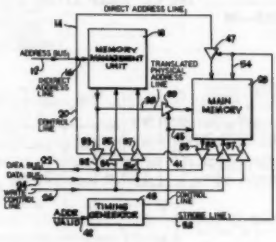
1. In a data processing system employing virtual memory management which includes a central processor and a main memory with a plurality of locations for storage of data, each of said locations addressable by a real address, the improvement comprising:

addressing means coupled to said central processor for providing virtual addresses including direct and indirect address segments, said direct address segment corresponding to a portion of a real address identifying a particular location in said main memory, and said indirect address segment corresponding to a virtual address identifying said particular location in memory;

an address bus having a plurality of parallel address lines coupled to said addressing means, and further including means for separating said virtual address from said addressing means into said direct and indirect address segments and applying said direct address segment directly to said main memory;

memory management means coupled to said address bus to receive said indirect address segment for translating said indirect address segment to a real address segment, said memory management means including means for applying said translated real address segment to physical address lines coupled to said main memory;

said locations in said main memory being defined at intersections of row and column control lines, the address of said particular location in said main memory specified by said translated real address segment and said direct address



segment, one of said row and column control lines coupled to receive said direct address segment and and the other of said row and column control lines coupled to receive said translated real address segment;

timing means for strobing said row and column address lines of said main memory to permit the accessing of data stored at said particular location, said timing means providing said strobe pulses to said main memory such that a strobe pulse for said direct address segment occurs shortly before a strobe pulse for said translated real address segment;

whereby said direct address segment is provided to said main memory without translation, and said strobe pulse for said direct address segment is applied to said main memory before said translated real address segment is applied to said main memory, thereby increasing the speed of access to said memory locations by beginning said access while said indirect segment is being translated by said memory management means.

4,527,233

ADDRESSABLE BUFFER CIRCUIT WITH ADDRESS INCREMENTER INDEPENDENTLY CLOCKED BY HOST COMPUTER AND EXTERNAL STORAGE DEVICE CONTROLLER

William H. Ambrosius, III, 27791 Ruisenor, Mission Viejo, Calif. 92692, and Randall Chung, 28192 Bluebell Dr., Laguna Niguel, Calif. 92677

Filed Jul. 26, 1982, Ser. No. 401,700

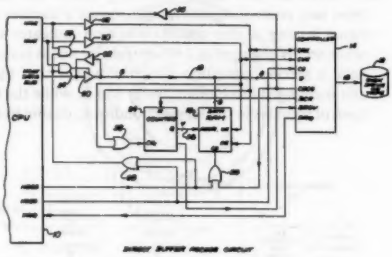
Int. Cl.³ G06F *13/00, 13/04, 15/16*

U.S. Cl. 364—200 **6 Claims**

1. A direct buffer access circuit for use in a data processing system having a host computer, an external data storage device for supplying data to the host computer, and a peripheral controller connected between the host computer and data storage device for controlling the operation of the data storage device and transferring data between the host computer and

the data storage device, the direct buffer access circuit comprising:

addressable memory means connected to the host computer and to the controller for receiving and storing data from the host computer for subsequent transmission to the storage device via the controller and for receiving and storing data from the storage device via the controller for subsequent transmission to the host computer and for receiving control signals from both the host computer and controller to indicate whether data is to be written into or read out of the memory means;



addressing means coupled to the memory means, the host computer, and the controller for providing an incrementable address signal to the memory means;

wherein the host computer provides first clocking signals to increment the addressing means to control the rate of addressing of the memory means during transfer of data between the host computer and memory means and wherein the controller provides second clocking signals to increment the addressing means to control the rate of addressing of the memory means during transfer of data between the storage device and the memory means.

4,527,234

EMULATOR DEVICE INCLUDING A SEMICONDUCTOR SUBSTRATE HAVING THE EMULATED DEVICE EMBODIED IN THE SAME SEMICONDUCTOR SUBSTRATE

Jeffrey D. Bellay, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 2, 1982, Ser. No. 404,094

Int. Cl.[3] **G06F** *11/00;* **G01R** *15/12*

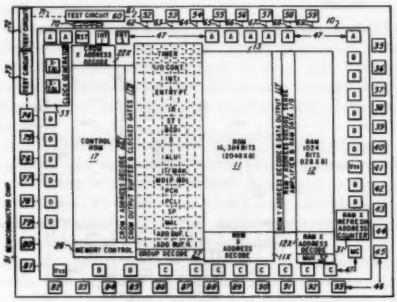
U.S. Cl. 364—200 **8 Claims**

1. A circuit emulator device for emulation of the function and operation of a predetermined electronic device embodied in a semiconductor substrate, said circuit emulator device comprising:

a semiconductor substrate (**51**);

said predetermined electronic device (**10**) embodied in a central area of said semiconductor substrate, said predetermined electronic device having a plurality of electronic circuits (**11**, **11x**, **12**, **12x**, **13**, **17**, **22x**, **27**, **28**, **31**, **32**, **33**), said predetermined electronic device having a first set of external interconnection means (A, B, C, D, RST, INT 1, INT 3, XAL, V_{ss}, MC, and V_{cc}) located at the periphery (**47**) of said central area connected to some of said plurality of electronic circuits for external connection of input, output and control signals to said predetermined electronic device;

a second set of external interconnection means (**35-45**, **52-59**, **74-93**) located at the periphery (**46**) of said semiconductor substrate outside said central area connected to other of said plurality of electronic circuits than said first set of external interconnection means for additional external connection of input, output and control signals to said predetermined electronic device, whereby the function and operation of said predetermined electronic device can



be controlled via said additional input and control signals and observed via said additional output signals.

4,527,235

SUBSCRIBER TERMINAL POLLING UNIT

Ronald J. Chebra, Mercerville, N.J., assignor to Base Ten Systems, Inc., Trenton, N.J.

Filed Mar. 15, 1983, Ser. No. 475,470

Int. Cl.[3] **G06F** *11/20*

U.S. Cl. 364—200 **6 Claims**

1. A subscriber services system polling unit comprising:

first and second microprocessor means for controlling the polling of subscriber terminals and for storing responses from said subscriber terminals, said first microprocessor means being primarily responsible for polling a first portion of said subscriber terminals and secondarily responsible for polling a second portion of said subscriber terminals, and said second microprocessor means being primarily responsible for polling said second portion of said subscriber terminals and secondarily responsible for polling said first portion of said subscriber terminals;

first polling means for interrogating said first portion of said subscriber terminals and for receiving responses from said first portion of said subscriber terminals;

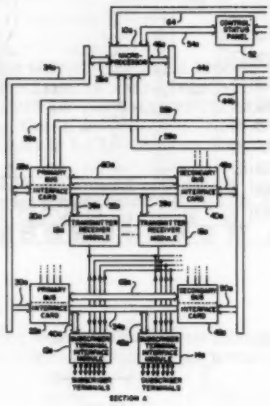
second polling means for interrogating said second portion of said subscriber terminals and for receiving responses from said second portion of said subscriber terminals;

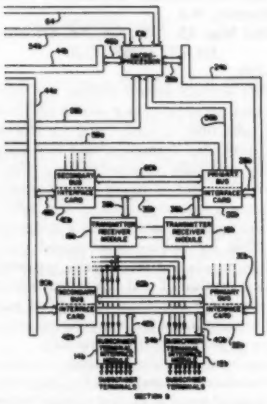
a first plurality of primary interface means for conducting control signals from said first microprocessor means to said first polling means to control operation of said first polling means by said first microprocessor means and for conducting responses from said first portion of said subscriber terminals to said first microprocessor means;

a second plurality of primary interface means for conducting control signals from said second microprocessor means to said second polling means to control operation of said second polling means by said second microprocessor means and for conducting responses from said second portion of said subscriber terminals to said second microprocessor means;

a first plurality of secondary interface means for conducting control signals from said first microprocessor means to said second polling means to control operation of said second polling means by said first microprocessor means and for conducting responses from said second portion of said subscriber terminals to said first microprocessor means;

a second plurality of secondary interface means for conducting control signals from said second microprocessor means to said first polling means to control operation of said first polling means by said second microprocessor means and for conducting responses from said first portion of said subscriber terminals to said second microprocessor means;





and switching means for selectively conducting said control signals from said first and second microprocessor means to said first and second polling means through said first and second pluralities of primary interface means and said first and second pluralities of secondary interface means.

4,527,236

COMMUNICATIONS DEVICE FOR DATA PROCESSING SYSTEM

Thomas R. Ermolovich, Lexington, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 137,509, Apr. 4, 1980,. This application Apr. 28, 1982, Ser. No. 372,624

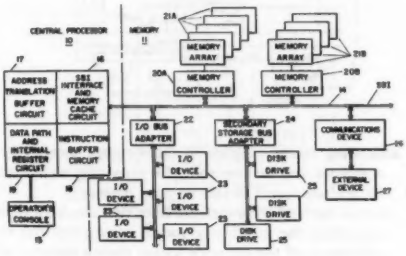
Int. Cl.³ G06F *3/04*

U.S. Cl. 364—200 **8 Claims**

1. A data processing system including a central processor unit, a memory unit, a data transfer control unit and an external unit, said central processor unit, said memory unit and said data transfer control unit being interconnected by a common bus including means for transferring an error signal, said data transfer control unit and said external unit both engaging in block transfers of data words under control of said central processor unit, said data transfer control unit and said external unit being interconnected by a device bus including means for transferring data and means for transferring transfer control signals to control the transfer of data therebetween, said data transfer control unit and said external unit each comprising:

(A) word count means for indicating when all of the data words in the block have been transferred;

(B) transfer control signal receiving means for receiving from said control signal transfer means a transfer control signal having a first condition which indicates that the other unit is engaged in a block transfer and is transferring data, a second condition which indicates that the other unit is engaged in a block transfer and is, while the transfer control signal is in the second condition, unable to transfer



data, and a third condition which indicates that the other unit is not engaged in the block transfer, said transfer control signal receiving means including decoding means for identifying when said transfer control signal has said first, second and third conditions;

(C) error signal generating means connected to said word count means and said transfer control signal receiving means for generating an error signal for transmission over said error signal transfer means of said common bus to said central processor unit if the received transfer control signal shifts from said first condition or said second condition to said third condition and said word count means indicates that all of the data words in the block have not been transferred, said error signal generating means not generating the error signal if the received transfer control signal shifts from said first condition to said second condition and said word count means indicates that all of the data words in the block have not been transferred.

4,527,237

DATA PROCESSING SYSTEM

Gideon Frieder, Williamsville; David T. Hughes, Amherst; Mark H. Kline; John T. Liebel, Jr., both of Williamsville; David P. Meier, Orchard Park, and Edward A. Wolff, Tonawanda, all of N.Y., assignors to Nanodata Computer Corporation, Buffalo, N.Y.

Continuation of Ser. No. 83,677, Oct. 11, 1979, abandoned. This application Apr. 14, 1983, Ser. No. 483,444

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **19 Claims**

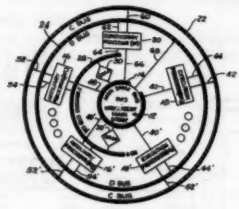
1. A data processing system comprising:

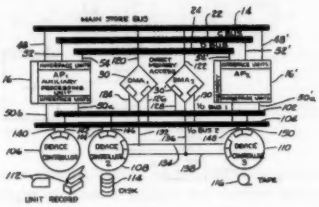
(a) a plurality of execution processors, each functioning to fetch, decode and execute instructions;

(b) a plurality of auxiliary processors, each functioning to provide services not performed by said execution processors including systems support, input-output processing and special instruction support;

(c) a supervisory processor for initiating, configuring and monitoring said system;

(d) communication means common to all of said processors for connecting all of said processors in said system in a manner such that any processor can identify any other processor and thereby communicate with any other processor at high speed commensurate with the single instruction speed of any one processor in order to transfer control information and data associated with the control information through said system;





(e) said communication means being separate from the memory of said system and connecting said processors in a tightly coupled manner with all of said processors sharing a common memory space;

(f) said communication means connecting said processors in a manner such that said execution processors are capable of being different from one another and nonhomogeneous and said auxiliary processors are capable of being different from one another and nonhomogeneous; and

(g) whereby data, control, and diagnostic information can be transferred simultaneously through said system.

4,527,238

CACHE WITH INDEPENDENT ADDRESSABLE DATA AND DIRECTORY ARRAYS

Charles P. Ryan, Phoenix; Russell W. Guenthner, Glendale, and Leonard G. Trubisky, Scottsdale, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Feb. 28, 1983, Ser. No. 470,353

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **4 Claims**

1. In a computer system, having a central processing unit (CPU) and further wherein the CPU includes a plurality of execution units, the computer system including a main memory and at least one cache memory, the cache memory comprising:

(a) a first input gate means for receiving a primary address;

(b) a first distribution network means, having a plurality of registers, said first distribution network means operatively connected to said first input gate means, for distributing said primary address among said plurality of registers to temporarily hold said primary address;

(c) first memory means organized to have a plurality of levels, operatively connected to said first distribution network means, for storing data in a plurality of blocks of a predetermined number of data words each level of the stored data being read simultaneously corresponding to the address being held in the corresponding register of said first distribution network means;

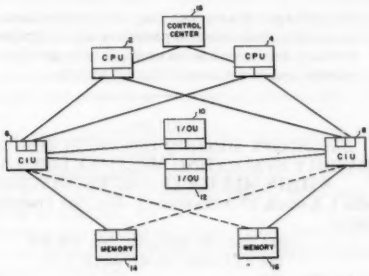
(d) switch means, operatively connected to each of said levels of said first memory means, for selecting one of the data words output from said levels, in response to a control signal;

(e) first backup register means, operatively connected to said first input gate means and operatively connected to said first distribution network means, for providing a delayed primary address to said first distribution network means;

(f) second input gate means for receiving said primary address;

(g) second distribution network means, having a plurality of registers, said second distribution network means operatively connected to said second input gate means, for distributing said primary address among said plurality of registers of said second distribution network means to temporarily hold said primary address;

(h) second memory means organized to have a plurality of levels, said levels of said second memory means corresponding to said levels of said first memory means, said



second memory means operatively connected to said second distribution network means, for storing directory data, said directory data corresponding by level to the block of predetermined data words of said first memory means each level of said second memory means being read simultaneously corresponding to the address being held in the corresponding register of said second distribution network means;

(i) input register means, having an input terminal adapted to receive a real page number portion of said primary address, for temporarily storing said real page number;

(j) comparator means, operatively connected to said input register means and operatively connected to said second memory means, for comparing the real page number from said input register to the real page numbers outputted from each level of said second memory means to generate said control signal for said switch means; and

(k) second backup register means, operatively connected to said second input gate means and operatively connected to said second distribution network means, for providing a delayed primary address to said second distribution network means.

4,527,239

DIGITAL DATA STORAGE METHODS AND APPARATUS

Christopher L. Brandin, 1502 E. Pikes Peak Ave., Colorado Springs, Colo. 80909

Filed Nov. 28, 1983, Ser. No. 555,569

Int. Cl.³ G06F *9/00*

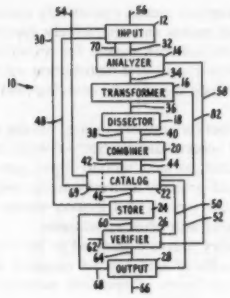
U.S. Cl. 364—300 **15 Claims**

1. The method of storing a predetermined bit pattern representing a permutation of data elements, comprising the steps of:

storing said predetermined bit pattern in a storage memory at an available location having a predetermined address;

deriving a key bit pattern from said predetermined bit pattern;

transforming said key bit pattern into a first index bit pattern and a second index bit pattern; and



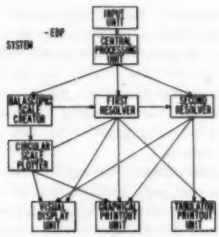
storing a bit pattern representing said predetermined address and said second index bit pattern in a catalog memory at a location determined in accordance with said first index bit pattern and said second index bit pattern.

4,527,240

BALASCOPY METHOD FOR DETECTING AND RAPIDLY EVALUATING MULTIPLE IMBALANCES WITHIN MULTI-PARAMETRIC SYSTEMS

Vadim I. Kvitash, 1775 Seventeenth Ave., San Francisco, Calif. 94122

Filed Dec. 29, 1982, Ser. No. 454,196
Int. Cl.[3] G06F *15/42*; A61B *5/04*
U.S. Cl. 364—415 **10 Claims**



1. A method of evaluating data in a multi-parametric system, comprising the steps of:

(a) obtaining a plurality of parametric data of such system;

(b) converting each datum obtained to a specially-normalized unit value equal to a percentage based upon the value of each parametric datum within the range between two existing and previously-determined extreme values of said parametric datum;

(c) providing a circular coordinate scale having radial axes corresponding to said respective parametric data of such system, each axis being identically calibrated in said specially-normalized unit values;

(d) plotting said specially-normalized unit values of said data as points on their respective axes of said circular coordinate scale;

(d) creating a pattern by interconnecting points on adjacent ones of said radial axes to form a closed configuration pattern; and

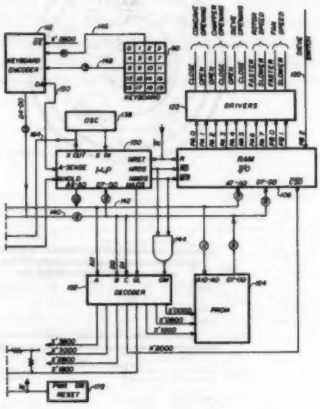
(e) evaluating said multi-parametric system by comparing said closed configuration pattern with at least one reference pattern plotted on a similar circular coordinate scale and representative of a known state in said system.

4,527,241

AUTOMATIC COMBINE HARVESTER ADJUSTMENT SYSTEM

Ronald T. Sheehan; E. William Rowland-Hill, both of Lancaster, and Carl E. Bohman, New Holland, all of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 30, 1982, Ser. No. 413,196
Int. Cl.[3] A01D *41/00*
U.S. Cl. 364—424 **17 Claims**



1. In a combine harvester adjustment system having a plurality of actuator means for selectively adjusting a corresponding plurality of system operating parameters over ranges of values, the improvement comprising:

a keyboard including a plurality of crop keys, one for selecting each of a plurality of crops;

first means for producing a signal representing the moisture level of a crop to be harvested;

memory means for storing sets of optimum operating values, there being one set of optimum operating values corresponding to each different combination of crop and moisture level with each set including an optimum operating value for each actuator means;

a microprocessor responsive to said first means and to actuation of one of said crop keys for reading from said memory the corresponding set of operating values; and,

output means responsive to said microprocessor and optimum operating values read from said memory for applying adjusting signals to said actuator means to adjust said operating parameters to said optimum operating values within the range of values for harvesting the selected crop.

14. The method of adjusting operating parameters of a combine harvester automatically, said method comprising:

storing sets of adjusting values, there being one set of adjusting values for each combination of a crop and a moisture level for that crop;

each set of values including an adjusting value corresponding to each operating parameter;

repetitively sensing said parameters to obtain the actual values thereof;

selecting a crop and a moisture level to thereby select one of said sets of adjusting values;

comparing the adjusting values in the selected one of said sets of adjusting values with said actual values; and,

adjusting each operating parameter until the comparison

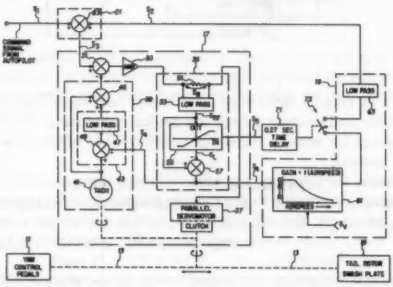
between the actual value and adjusting value for that parameter indicates that the two are equal.

4,527,242

AUTOMATIC FLIGHT CONTROL PILOT ASSIST SYSTEM

Kenneth W. McElreath, and Gordon R. Fabian, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 28, 1982, Ser. No. 392,917
Int. Cl.³ B64C *13/00*; G05D *1/08*
U.S. Cl. 364—434 **20 Claims**



1. For use in an aircraft having an autopilot for providing one or more flight command signals and further having a manually operable device mechanically coupled through appropriate linkages to a flight control surface so as to afford positioning of said surface, the apparatus comprising:

(i) signal combining first means for receiving a command signal S_{at} from the autopilot, and (b) a signal S_m, and for combining S_m and S_{at} in a predetermined phase relationship,

(ii) second means connected for receiving a control signal S_{cp} from said first means and comprising:

(a) servomotor means connected to said linkages so as to operate in parallel with said manually operable device;

(b) means for receiving S_{cp} and a feedback signal and producing therefrom a corrective error signal S_{ep} for causing the servomotor output position to change;

(c) sensing means comprising circuit means, responsive to S_{ep}, for providing a signal S_x indicative of the excess of S_{ep} over a predetermined reference R_1, said excess being caused by a sufficient manual force being applied through said manually operable device and through said linkages to said flight control surface,

(d) feedback circuit means for receiving the parallel servomotor output and signal S_x and in response thereto producing said feedback signal, said feedback circuit means responding to signal S_x and to the parallel servomotor output such that S_x and the parallel servomotor output evoke oppositely phased components of said feedback signal; and

(iii) third means, responsive to S_x, for producing a signal simulative of the changes in the autopilot command signal S_{at} which result from the aircraft responding to the manual force, the change-simulative signal provided by said third means being the signal S_m,

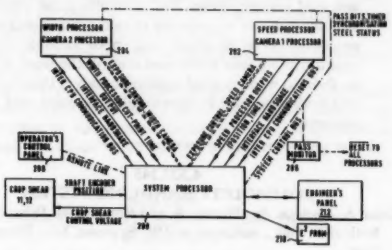
and said predetermined phase relationship in which S_m and S_{at} are combined by said first means being a phase relationship such that S_m and said changes in S_{at} tend to cancel one another.

4,527,243

CROP SHEAR CONTROL

Peter W. Loose, 11 Longstomps Ave., Chelmsford, England

Filed Jun. 17, 1982, Ser. No. 389,237
Claims priority, application United Kingdom, Jun. 19, 1981, 8118912; Nov. 20, 1981, 8135096
Int. Cl.³ G06F *15/46*; B21B *37/00*
U.S. Cl. 364—469 **11 Claims**



1. Apparatus for controlling a flying crop shear comprising,

first electronic camera means positioned to scan in the direction of motion a moving bar to be cropped and to produce first video data in response to said scan,

first means for analysing said first video data to determine the speed and position of said bar relative to said crop shear,

means for controlling the motion of said crop shear to crop said bar at a desired point of crop,

second electronic camera means positioned to scan the width of said bar and to produce second video data in response to said scan, and

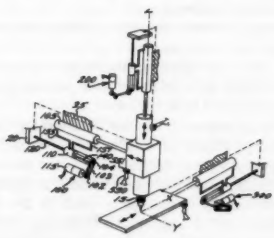
second means for analysing said second video data to determine said desired point of crop as a function of the shape of the end of said bar.

4,527,244

ELECTRO-HYDRAULIC POSITION CONTROL FOR A MACHINE TOOL WITH ACTUAL AND COMMANDED POSITION FEEDBACK

Merrill E. Graham, Jr., P.O. box 545, Tehachapi, Calif. 93561, and Ronnie L. Blankenship, 43215 43rd St. West, Quartz Hill, Calif. 93534

Filed Apr. 21, 1982, Ser. No. 370,205
Int. Cl.³ G05B *13/00*
U.S. Cl. 364—474 **11 Claims**



1. In a machine tool wherein a tool implement is positioned by at least one hydraulic ram controlled by at least one hydraulic valve, an improved control system comprising:

rotary electric drive means;

a rotating member coupled to and driven by said rotary electric drive means, and coupled to each said hydraulic valve, comprising at least a spool member coupled to a fixed lead screw such that the axial position of said spool

member along said screw is substantially directly related to the movement of said tool implement, and controls the flow of hydraulic fluid to said coupled hydraulic valve for driving said valve;

sensing means for directly sensing the action of said electric drive means and generating a signal indicative of said action; and

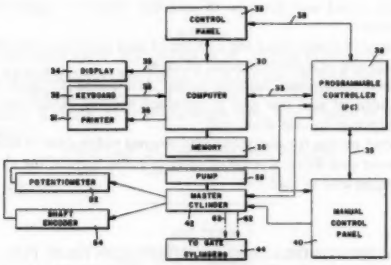
central controller means coupled to said electric drive means and said sensing means for controlling the operation of said drive means in response to said sensing means indicator signal so as to cause said spool member to change position along said screw and control the flow of hydraulic fluid to said coupled hydraulic valve, thereby causing said hydraulic ram to controllably position said tool implement.

4,527,245

COMMODITY HANDLING SYSTEM

John A. Axelson, Jr., Bismarck, and Kenneth M. Wise, Mandan, both of N. Dak., assignors to JBC Systems, Inc., Bismarck, N. Dak.

Filed Jun. 8, 1982, Ser. No. 386,239
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—478 **19 Claims**
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 130 Pages)



1. An apparatus for blending commodities in a commodity handling system, the commodity handling system including container means for holding the various commodities, the commodity handling system further including discharge means for enabling commodities to be discharged from said container means, the commodity handling system additionally including conveyor means for moving said commodities, the blending apparatus comprising:

(a) means for selecting the container means whose commodities are to be blended together;

(b) means for selecting the relative proportion of the commodities to be blended as a percentage of the total commodities to be blended;

(c) determining means for determining the amount the discharge means of said container means selected must be opened so as to derive the selected percentages, said determining means including means for determining the rate of commodity discharge at each of the selected container means and storage means including a set of predetermined values for defining the relationship between the rate of commodity discharge and the discharge means opening at each of the selected container means; and

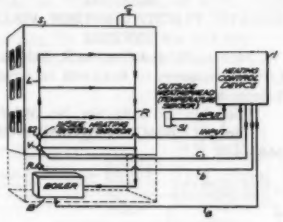
(d) opening means for opening said discharge means of the selected container means the amount required, said opening means including master cylinder means interconnected to a plurality of slave cylinders for selectively actuating said slave cylinders, said slave cylinders being operatively interconnected to said discharge means for opening of said discharge means of the selected container means upon being actuated by said master cylinder means.

4,527,246

HOT WATER HEATING SYSTEM CONTROL DEVICE

Vijay Masson, Forest Hills, N.Y., assignor to Heat-Timer Corporation, Fairfield, N.J.

Filed Apr. 14, 1982, Ser. No. 368,380
Int. Cl.³ F24H *3/06*
U.S. Cl. 364—505 **11 Claims**



11. A control device for a hot water heating system having a boiler and a water pump, the device comprising:

means for sensing the temperature outside of the area to be heated;

means for selecting a predetermined pump set point;

means responsive to the outside temperature for turning the pump on and off when the outside temperature respectively drops below and exceeds the predetermined pump set point;

means for sensing the actual water temperature in the system;

means defining a set of water reset ratios of the outside temperature to the water temperature and a range of offset adjustments for each ratio including means for selecting a water reset ratio and offset therefor;

means for periodically determining the desired water temperature at the output of the mixing valve for the selected water reset ratio and offset and receptive of the actual water temperature for comparing the actual water temperature to the desired water temperature; and

means for step controlling the mixing valve when the pump is turned on to open and close same when the actual water temperature respectively drops below and exceeds the desired water temperature, comprising means for varying the temperature differential about the computed water temperature for which the boiler is turned on and off.

4,527,247

ENVIRONMENTAL CONTROL SYSTEM

Fredrick P. Kaiser, Orange, and Theodore R. Lapp, Mission Viejo, both of Calif., assignors to IBG International, Inc., Prairie View, Ill.

Continuation of Ser. No. 288,740, Jul. 31, 1981, abandoned. This application Jun. 19, 1984, Ser. No. 621,884
Int. Cl.³ G06F *15/46*; H04Q *11/00*
U.S. Cl. 364—550 **39 Claims**

1. A controller based system for operating over an AC voltage power transmission line comprising:

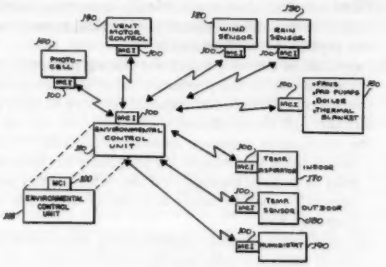
a plurality of communication interface units coupling to the AC voltage power transmission line and providing bidirectional data communication over the power line;

a central processing unit coupling to and bidirectionally communicating with one of said communication interface units;

at least one peripheral control element located remotely with respect to the central processing unit, each of said peripheral control elements coupling to and bidirectionally communicating with one of said communication interface units;

wherein bidirectional communication is achieved between the central processing unit and said at least one peripheral

control element at assigned time slots via the communication interface units over the power transmission line; and wherein said central processing unit can selectively interrogate said at least one peripheral control element and receive a reply, and can selectively command said at least one peripheral control element to take an appropriate action.

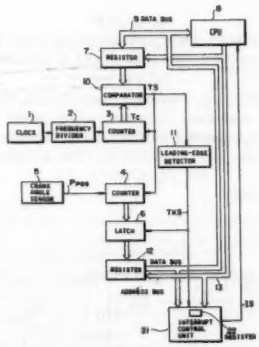


4,527,248

ENGINE SPEED SENSING DEVICE

Sadao Takase; Katsunori Oshiage; Akito Yamamoto, and Akio Hosaka, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1981, Ser. No. 333,742
Claims priority, application Japan, Dec. 26, 1980, 55-184112
Int. Cl.³ F02P 5/03; G01P 3/42
U.S. Cl. 364—565 **2 Claims**



1. An engine speed sensing device for use in control of an internal combustion engine having a crankshaft, said engine speed sensing device comprising:

a crank angle sensor for producing an angle pulse each time said crankshaft rotates through a predetermined angle;

a counter connected to said sensor for counting angle pulses from said sensor;

means for determining a time interval during which said counter counts the angle pulses and for producing a control signal when each time interval has elapsed;

a leading edge detector for detecting the leading edge of the control signal and for outputting a corresponding detection signal, said detection signal occurring at substantially the same time as said control signal;

means responsive to the detection signal for latching the count value of said counter;

means for receiving the latched counter value;

said latching means comprising a latch element connected between said counter and said receiving means, said latch element being responsive to said detection signal for latching the contents of said counter and for outputting the latched counter contents to said receiving means;

said counter being responsive to the control signal to be cleared such that the contents of said counter are latched and then said counter is cleared almost immediately;

an interrupt control unit responsive to the detection signal for producing an interrupt request signal, said interrupt control unit comprising a first register, said first register having a bit location which is set to a predetermined state in response to said detection signal;

a central processing unit for executing a plurality of different programs;

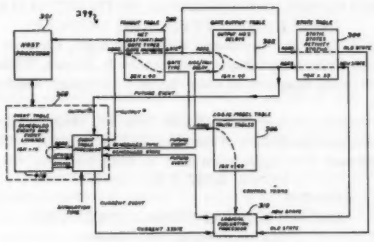
said central processing unit being responsive to the interrupt request signal for reading said first register and being responsive to said predetermined state of said bit location to read the count value latched in said receiving means.

4,527,249

SIMULATOR SYSTEM FOR LOGIC DESIGN VALIDATION

Nicholas P. Van Brunt, White Bear Lake, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 22, 1982, Ser. No. 436,162
Int. Cl.³ G06G 7/48; G06F 15/16
U.S. Cl. 364—578 **5 Claims**



1. A logic simulator apparatus for verifying the design of logic devices having a plurality of circuit elements by simulating the characteristics of the circuit elements comprising in combination:

a host computer processor for reading data into the apparatus and for reading data out of the apparatus,

a "net list" memory connected to receive and transmit data from said host processor for receiving data relating to the circuit elements of the logic device under test,

a model table memory for containing information describing the logical function of all circuit elements in the logic design to be verified,

a first register for reading the contents of said "net list" memory and said model table memory, said first register being connected to receive data from said "net list" memory and said model table memory,

a second register connected to receive data from said first register,

a state table memory connected to receive data from said second register for said "net list" and said model table,

a module ring control for providing and receiving external state table information under control of said host processor, said module ring control being connected to control said second register, said module ring control controlling said second register to provide change of state table information for said state table memory from other logic devices under test and under control of said host processor,

a logical evaluator connected to receive and transmit data from said state table memory for using said "net list" information and said model table information to generate a new state table information for the logical elements of the logic design to be verified, said logical evaluator pro-

viding a return input to said state table memory to replace old state table information with new state table information in said state table memory at each simulation sample time where each simulation sample time interval is shorter than the time interval of operation of any logic device under test,

a net list address register connected to and for controlling said "net list" memory, and

a memory and clock control for controlling the operation of said apparatus to operate at a predetermined number of simulation sample times within one logical cycle of said logic system design to be verified wherein said "net list" memory contains the current state of particular logical elements and wherein said model table memory contains information regarding the operation of particular logical elements and wherein said state table memory and said logical evaluator evaluates the state of logical elements having a changed input at each sample time and does not evaluate the change in state for logical elements not receiving a change in input at the particular sample time and wherein said memory and clock control is responsive to said module ring control to receive an input from or provide an input to said module ring control for external devices at appropriate times within said logical cycle.

4,527,250

VIDEO COMPUTER TERMINAL WITH DETACHABLE INTELLIGENT KEYBOARD MODULE

Daniel J. Galdun, Huntsburg; Odo J. Struger, Chagrin Falls; Valdis Grants, Lyndhurst, and Ronald A. Brown, Willowick, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

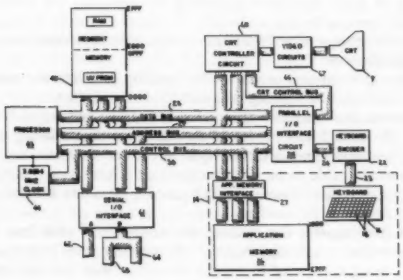
Continuation of Ser. No. 186,254, Sep. 11, 1980, which is a continuation-in-part of Ser. No. 75,176, Sep. 12, 1979, abandoned. This application May 9, 1983, Ser. No. 490,740

Int. Cl.[3] G06F *3/023, 3/153*

U.S. Cl. 364—900 **11 Claims**

MICROFICHE APPENDIX INCLUDED

(12 Microfiche, 576 Pages)



1. A computer terminal of the type having video display means, a processor interfaced to the video display means to couple characters thereto, keyboard interface means coupled to the processor for transmitting user inputs to the processor, and an I/O port coupled to the processor for receiving data from an external device and for transmitting data to the external device, wherein the improvement comprises:

resident memory means coupled to the processor, the resident memory means storing a first sequence of processor instructions that direct the processor in receiving character data from the I/O port and displaying characters on the video display means, and the resident memory means storing a second sequence of processor instructions that enable the processor to detect the connection of an application module; and

an application module removably connected as a portion of the computer terminal and including

(a) a keyboard for manually entering user application characters and other inputs,

(b) first interface means electrically connected to the keyboard for providing releasable electrical connection with the keyboard interface means,

(c) application memory means for storing processor instructions that enable the processor to set up user application characters for display in response to entry of such characters through the keyboard,

the application memory means storing other processor instructions that enable the processor to direct the display of prompt messages on the video display means to prompt a user to select a mode of operation for the terminal, and

the application memory means storing application sequences of processor instructions corresponding to available modes of operation; and

(d) second interface means electrically coupled to the application memory means for providing releasable electrical connection with the processor; and

wherein the operation of the processor begins under the control of processor instructions from the resident memory means, and when the processor detects the connection of the application module, the operation of the processor is switched to the control of processor instructions from the application memory means; and

wherein the processor is operable in response to mode selection user inputs entered through the keyboard in response to the prompt messages to execute processor instructions stored in the application memory means in one of the application sequences that corresponds to the selected mode of terminal operation.

4,527,251

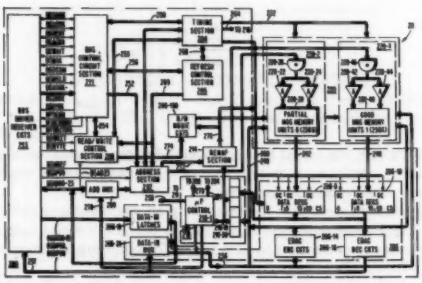
REMAP METHOD AND APPARATUS FOR A MEMORY SYSTEM WHICH USES PARTIALLY GOOD MEMORY DEVICES

Chester M. Nibby, Jr., Peabody; Reeni Goldin, Somerville, and Timothy A. Andrews, Arlington, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 17, 1982, Ser. No. 450,691

Int. Cl.[3] G06F *13/00*

U.S. Cl. 364—900 **31 Claims**



1. A remapping system for use with an addressable partially good memory including a plurality of partially good RAM chips each having a number of internal rows and columns of bit locations containing a number of randomly distributed faults, said plurality of partially good chips being organized into a number of system rows and columns, said columns being organized into a small number of groups of bits, and an addressable good memory having a plurality of defect-free RAM chips, each chip being organized internally into said number of internal rows and columns, said plurality of chips being organized

into at least one system row and into a number of system columns, said number of system columns being organized into the same number of groups as said partially good memory, said remapping system comprising:

an addressable static RAM memory having a plurality of locations corresponding in number to at least the number of system rows times the number of internal rows or columns whichever is larger, each location having a plurality of column address bit locations and a plurality of slice bit locations corresponding in number to said number of groups and each associated with a different one of said number of groups; and,

processing means connected to each of said memories, said processing means for addressing each of said static memory locations and forcing each of said plurality of slice bit locations to a first state when the group of bit locations associated therewith in a corresponding one of said partially good memory locations is detected as being faulty; and, said processing means including means for assigning column addresses identifying locations in said good memory in a predetermined manner according to category of fault to each static memory location which contains at least one slice bit location in said first state to maximize the use of each of said good memory groups of bit locations.

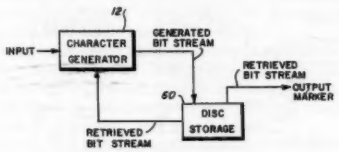
4,527,252
CHARACTER GENERATOR

James M. Donohue, Brighton, N.Y., and Andrew T. Ling, Rancho Palos Verdes, Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 270,949, Jun. 5, 1981,. This application Oct. 3, 1983, Ser. No. 538,609

Int. Cl.³ G06F *3/12*

U.S. Cl. 364—900 **14 Claims**



1. The method of operating a character generator having a processor and a memory for driving an output marker in a printing system comprising the steps of

(a) converting character coded input data into bit streams in the processor,

(b) allocating the converted bit streams onto the memory,

(c) retrieving the converted bit streams from the memory,

(d) merging in the processor the retrieved bit streams with other bit streams currently converted in the processor,

(e) allocating the merged bit streams back onto the memory, and

(f) retrieving the merged bit streams from the memory to drive the output marker.

4,527,253
DATA SEARCHING APPARATUS

Kazuhiro Sato, Ebina; Takashi Kumagai; Takuo Ishizuka, both of Hadano, and Tadatsugu Ishizuka, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 28, 1982, Ser. No. 383,271

Int. Cl.³ G06F *7/02, 7/04*

U.S. Cl. 364—900 **22 Claims**

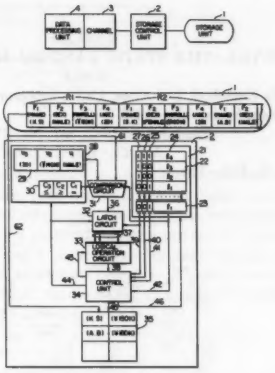
1. A data searching apparatus comprising:

a storage unit for storing a record having a plurality of fields;

first setting means for storing a compare condition and compare data for each field of a record in said storage unit;

compare means connected to receive a record transferred from said storage unit for comparing said fields of said transferred record with said compare data in accordance with said compare condition set in said first setting means and in synchronism with said transferring of said record;

logical operation means connected to receive the output of said compare means for logically operating on the compare results of said compare means in synchronism with said transferring of said record to check whether or not said fields meet said compare condition;



a buffer memory for storing selected fields of said record according to attributes of said fields;

second setting means for storing attributes of said fields of said record; and

control means connected to said buffer memory and said logical operation means for writing only those fields into said buffer memory which are determined by said logical operation means to meet said compare condition and which have a given attribute as designated by said second setting means.

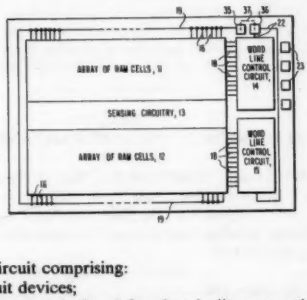
4,527,254
DYNAMIC RANDOM ACCESS MEMORY HAVING SEPARATED V_{DD} PADS FOR IMPROVED BURN-IN

Charles T. Ryan, Poughkeepsie, N.Y.; Roy E. Scheuerlein, Burlington, Vt., and Lucian A. Kasprzak, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 15, 1982, Ser. No. 441,709

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—51 **8 Claims**


ARRAY OF RAM CELLS, 11
SENSING CIRCUITRY, 13
ARRAY OF RAM CELLS, 12
WORD LINE CONTROL CIRCUIT, 14
WORD LINE CONTROL CIRCUIT, 17

4. A memory circuit comprising:

peripheral circuit devices;

a memory voltage terminal pad for electrically connecting said peripheral circuit devices to a low voltage source;

an array of charge storage devices;

a charge storage device voltage terminal pad for electrically connecting said array of charge storage devices to a high voltage source; and

means for selectively electrically connecting said memory voltage, terminal pad to said storage device voltage terminal pad;

whereby said array of charged storage devices can be tested at a high operating voltage without damaging said peripheral circuit devices, and may be operated at a low voltage subsequent to high voltage testing.

4,527,255

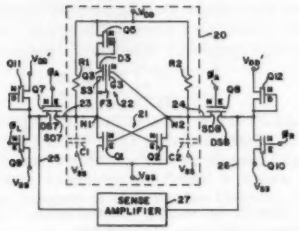
NON-VOLATILE STATIC RANDOM-ACCESS MEMORY CELL

Parviz Keshtbod, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Jul. 6, 1982, Ser. No. 395,531

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—154 **17 Claims**



1. A memory cell wherein: a volatile storage location has first and second cross-coupled like-polarity field-effect transistors (FET's) whose sources are coupled to a reference voltage supply that provides a reference voltage and whose drains are coupled through a load circuit to a power supply that provides a supply voltage at a first level for normal storage of a given data bit in the cross-coupled FET's; a non-volatile storage location has a like-polarity variable-threshold insulated-gate FET whose insulated-gate electrode is coupled to the drain of the second FET, whose drain is coupled to the power supply, and whose source is coupled to the drain of the first FET; the non-volatile storage location assumes a logic state corresponding to the given data bit when the supply voltage is moved to a second level where the absolute value of the difference between the second level and the reference voltage exceeds the absolute value of the difference between the first level and the reference voltage; and the given data bit is automatically restored to the cross-coupled FET's when the supply voltage is returned to the first level; characterized in that the load circuit comprises: a first impedance element coupled between the power supply and the drain of the first FET along a path electrically in parallel with the path coupling the variable-threshold FET between the power supply and the drain of the first FET; and a second impedance element coupled between the power supply and the drain of the second FET.

4,527,256

ELECTRICALLY ERASABLE MEMORY MATRIX (EEPROM)

Burkhard Giebel, Denzlingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,759

Claims priority, application European Pat. Off., Mar. 17, 1982, 82102142.5

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—154 **9 Claims**

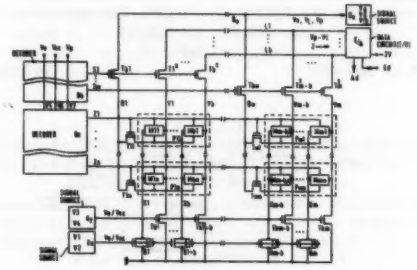
1. Electrically erasable memory matrix (EEPROM) comprising storage groups arranged in w blocks with b columns each and arranged in n rows, with b electrically re-programmable storage cells each, with each of the storage cells containing each time one tunnel injector (I) which is effective in both directions and towards each time one electrically floating gate electrode (Fg) and which, on the one hand, via the source-drain line of a memory transistor (Ts) is connected to a first bit line (X) and, on the other hand, via the source-drain line of a selection transistor (Ta), is connected to a second bit line (Y), with the control gate of the memory transistor being connected to a programming line (P) while the gate of the selection transistor (Ta) is contacted to a row selection line (Z), in which memory matrix

the gates of the w.b=m selection transistors (Ta) of each row, via one common row selection line (Z1 . . . Zn) are connected to each time one of n outputs of a row decoder (Dz),

the control gates of the b memory transistors (Ts) of each group are connected to one common programming line (P11 . . . Pwn) and, via the source-drain line of a group selection transistor (T11 . . . Twn) whose gate is connected to the corresponding common row selection line (Z1 . . . Zn) are connected in blocks to one common block line (P1 . . . Pw), with m/b=w being a whole number (integer),

the storage cells are contacted in a columnwise manner to each time one continuous, common first and second bit line (X1 . . . Xm; Y1 . . . Ym),

the block lines (B1 . . . Bw) are connected to a block signal



source (Bs) via the source-drain line of a block selection transistor (Tb1 . . . Tbw) per block, with the gates thereof being connected to one of w outputs (S1 . . . Sw) of the block decoder (Db),

the outputs (S1 . . . Sw) of said block decoder (Db) are each connected in blocks to the gates of b column selection transistors ($T1^1$ . . . Tb^1; $Tm\text{-}b^1$ . . . Tm^1) whose source-drain lines, in turn, connect each time one of the second bit lines (Y1 . . . Yb; . . . ;Ym-b . . . Ym) of each block to one of the data lines (L1 . . . Lb), and

the row selection line (Z1 . . . Zn), the block line (B1 . . . Bw), the first bit lines (X1 . . . Xm) and the second bit lines (Y1 . . . Ym) are capable of being connected to suitable potentials in accordance with a first function "Reading Selected", a second function "Reading Not Selected", a third function "Erasing Selected", a fourth function "Erasing Not Selected", a fifth function "Writing Selected", a sixth function "Writing Not Selected", or a seventh function "Inactive", characterized in

that between said m first bit lines (X1 . . . Xm) and ground, there are arranged the switching sections of each time one of m clamping gates (G1 . . . Gm), with one clamping gate consisting of a source-drain parallel arrangement of a transistor of the enhancement type and of one transistor of the depletion type, and

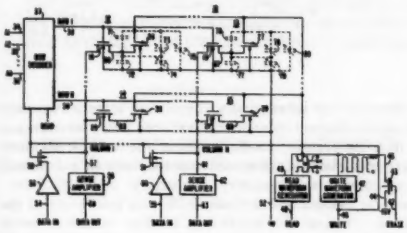
that the gates of all of said clamping gates (G1 . . . Gm) are jointly controlled by one X-clamping signal source (Kx) in such a way that a first potential (V1) identical or almost

identical to the ground potential (Vo) according to the fifth function or the sixth function, or else a second potential (V2) identical or almost identical to the operating potential (Vcc) corresponding to the first through fourth or seventh function can be set randomly.

4,527,257
COMMON MEMORY GATE NON-VOLATILE TRANSISTOR MEMORY

James R. Cricchi, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 25, 1982, Ser. No. 411,176
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—184 **22 Claims**



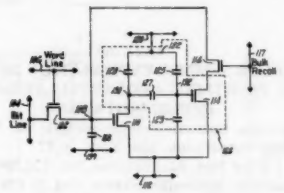
19. A non-voltile semiconductor memory cell comprising:
a fixed threshold transistor and a variable threshold transistor disposed within a common semiconductor body,
said fixed threshold transistor having a source, gate, and drain,
said variable threshold transistor having a source, gate and body and functions to store data by the presence or absence of a channel formed in said body,
the gate electrode of the variable threshold transistor of each memory cell isolated by dielectric material from the body of the variable threshold transistor, which gate electrode of each memory cell is coupled together and adapted for coupling to a memory gate signal,
said drain of said fixed threshold transistor coupled to the source of said variable threshold transistor,
said gate of said fixed threshold transistor adapted for coupling to a memory cell select signal,
said source of said fixed threshold transistor adapted for coupling to a sense amplifier during a read operation and to a voltage indicative of a logic state to be stored during a write operation; and
said memory gate signal having an erase pulse at first times, a sequence of write pulses at second times and a sequence of read pulses at third times.

4,527,258
E²PROM HAVING BULK STORAGE

Daniel C. Guterman, Plano, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Sep. 30, 1982, Ser. No. 431,464
Int. Cl.³ G11C *7/00, 11/40*
U.S. Cl. 365—185 **3 Claims**

1. An electrically alterable read only memory comprising:
a plurality of memory cells, each comprising:
an electrically alterable nonvolatile memory element;
means for reading out data entered in said non-volatile element;
means for writing data to be stored in said non-volatile memory element, characterized in that:
said means for reading out data comprises an output transistor connected between a bit line and a first node and having its gate controlled by a word line, and a recall transistor connected between a first terminal of a nonvolatile floating gate transistor and said first node and having its gate controlled by a recall signal common to all of said plurality of cells, a second terminal of which floating gate transistor is connected to a virtual ground terminal;
said means for writing data comprises means for placing the logical inverse of the data to be stored on said first nodes of all of said memory cells and high voltage electrode means common to all of said memory cells for applying a

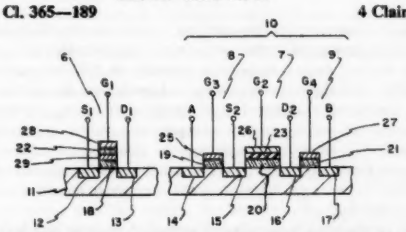


high voltage simultaneously to each of said memory cells, whereby a floating gate within said nonvolatile memory element is controlled in response to said inverted data on said first node by a control transistor connected between virtual ground and a control gate of said floating gate transistor, while said recall transistor is maintained in a nonconducting state, the gate of which control transistor is connected to said first node.

4,527,259
SEMICONDUCTOR DEVICE HAVING INSULATED GATE TYPE NON-VOLATILE SEMICONDUCTOR MEMORY ELEMENTS

Takeshi Watanabe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1982, Ser. No. 420,028
Claims priority, application Japan, Sep. 22, 1981, 56-150393
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—189 **4 Claims**



1. A semiconductor processor device comprising a ROM, an input/output circuit, a RAM, and a central processing unit formed on a semiconductor substrate;
said ROM including a matrix of memory cells arranged in a plurality of rows and columns, each of said memory cells comprising a first insulated gate type non-volatile semiconductor memory transistor, each of said first memory transistors having a gate electrode connected to a row line, a floating gate electrode, a source region and a drain region, one of said source and drain regions being connected to a column line; means for selectively and electrically writing information in the first memory transistor; means for selectively and electrically reading information from said first memory transistor; and means using ultraviolet rays for erasing information stored in said first memory transistor;
said central processing unit having an instruction decoder, said instruction decoder including a matrix of memory cells arranged in a plurality of rows and columns, each of said memory cells comprising at least two insulated gate type transistors, one being a second non-volatile memory transistor and the other being a selection transistor connected in series with said second memory transistor;

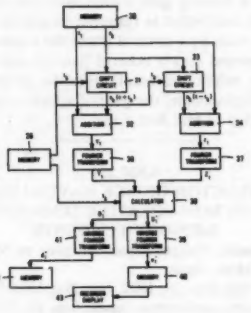
means for activating the selection transistor in order to select the associated second memory transistor; means for electrically writing information in the selected second memory transistor; means for electrically reading information from the selected second memory transistor; and means for erasing information stored in the selected second memory transistor electrically.

4,527,260

METHOD FOR SEISMIC EXPLORATION BY VERTICAL SEISMIC PROFILING AND INSTALLATION FOR ITS IMPLEMENTATION

Leon Horowicz, Sceaux, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,799
Claims priority, application France, Oct. 9, 1981, 81 40156
Int. Cl.³ G01V *1/28*
U.S. Cl. 367—27 **6 Claims**



1. A seismic exploration method for determining characteristics of a geological formation by obtaining a plurality of signals (s_k) derived from a respective plurality of different positions within a borehole that traverses said geological formation and by combining said plurality of signals after having shifted all but one of said signals by a respective acoustic transit time period (t_k) in order to enhance the contribution of seismic signals traveling in one direction while reducing the contribution of seismic signals traveling in the opposite direction, characterized by:

a. determining a plurality of propagation times required for a seismic signal to propagate between a first detector position and a plurality of other detector positions;

b. delaying each of the seismic signals detected at each of said other detector positions by respective propagation times;

c. advancing each of the seismic signals detected at each of said other detector positions by respective propagation times;

d. correcting each of said delayed signals and each of said advanced signals for the effects of the transmissivity of the respective portion of the formation traversed by each of said signals by the application of a transmissivity correction operator;

e. combining said corrected delayed signals with the signal detected at said first detector position to produce a first combined signal (y_1');

f. combining said corrected advanced signals with the signal detected at said first detector position to produce a second combined signal (Z_1'); and

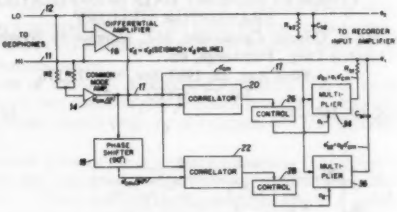
g. generating a signal indicative of an optimum estimation of the upgoing wave component by combining said first and second combined signals.

4,527,261

HILINE INTERFERENCE ELIMINATOR

Miles A. Smither, Houston, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Filed Oct. 7, 1981, Ser. No. 309,365
Int. Cl.³ G01V *1/36*
U.S. Cl. 367—76 **17 Claims**



17. Circuitry for substantially eliminating from a two wire seismic signal channel an undesired induced hiline interference signal in a differential mode, wherein the undesired hiline interference signal also is present on the lines in a common mode component, said circuitry comprising

a common mode amplifier coupled to the two wires of the seismic channel for producing a hiline common mode signal having substantially no hiline differential mode component therein,

a differential mode amplifier coupled to the two wires of the seismic channel for producing a hiline differential mode signal having substantially no hiline common mode component therein,

phase shifting means responsive to said hiline common mode signal for producing a quadrature phase hiline common mode signal,

multiplexing means for producing a multiplexed signal comprised of said hiline common mode signal that occurs during a first one of alternately occuring time periods followed by said quadrature phase hiline common mode signal during the other one of said alternately occurring time periods,

signal correlation means responsive to said multiplexed signal and to said hiline differential mode signal for correlating the hiline common mode signal and the quadrature phase hiline common mode signal with said hiline differential mode signal and producing respective alternately ocurring first and second correlating signals in response thereto,

means responsive to said correlating signals for producing respective up/down count command signals that have different characteristics when the respective correlating signal has different signs,

means responsive to said correlating signals for producing corresponding clock signals whose frequencies are functions of the magnitudes of the respective correlating signal, without regard to the sign of the respective correlating signal,

first counter means responsive to a first one of said up/down command signals and to a first one of said clock signals for producing a first count that is a function of the magnitude of said first correlating signal without any correction applied to said seismic channel, said first up/down command signal and the first correlating signal being associated with said hiline common mode signal,

second counter means responsive to the second one of said up/down command signals and to said second correlating signal for producing a second count that is a function of the magnitude of the second correlating signal without any correction applied to said seismic channel,

a first multiplying means for multiplying said first count with said hiline common mode signal to produce a first analog correcting signal,

a second multiplying means for multiplying said second count with said hiline common mode signal to produce a second analog signal,

resistor means for coupling said first correcting signal to a hi one of the two wires of the seismic channel,

capacitor means for coupling said second correcting signal to said hi one of the two wires of the seismic channel,

substantially identical resistor and capacitor means connected between the lo one of said two wires and ground,

said first and second multiplying means operating to produce respective correcting signals that reduce said first and second correlating signals substantially to zero,

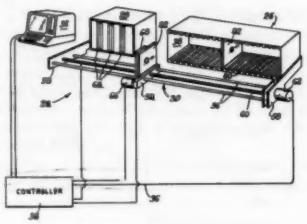
said first and second counter means retaining respective counts that cause said correcting signals to reduce the correlation between said hiline common mode signal and said hiline differential mode signal to zero and to reduce the correlation between the quadrature phase hiline common mode signal and the hiline differential mode signal to zero.

4,527,262

INFORMATION STORER AND RETRIEVER

Charles L. Manto, Chicago, Ill., assignor to Manto Incorporated, Palatine, Ill.

Filed Jul. 28, 1982, Ser. No. 402,640
Int. Cl.³ G11B *17/22*
U.S. Cl. 369—33 **37 Claims**



1. An information storage and retrieval system comprising:

a plurality of tangible media of different thicknesses and shapes for embodying stored information;

a storage section for receiving and holding each of said different tangible medium;

a transducer for transferring information with respect to said tangible medium when said medium is in an information transferring position in said transducer;

a single transport mechanism movable to and from the storage section and movable to and from said transducer for transporting said tangible medium from said storage section to said transducer and from said transducer to said storage section;

means on said transport mechanism for retrieving said tangible medium from one of said storage section and said transducer at a time and alternately placing or replacing said tangible medium therein, said means being in the form of a clamping device capable of both grabbing and removing said tangible medium of different thicknesses and shapes from either said transducer or said storage section and including a pair of opposing clamping members and means for both separating and closing said members to grab, retain and release said tangible medium;

said clamping members being on said single transport mechanism and movable to achieve the transport between the storage section and the transducer;

control means for controlling both said transport mechanism and said retrieving, placing and replacing means; and

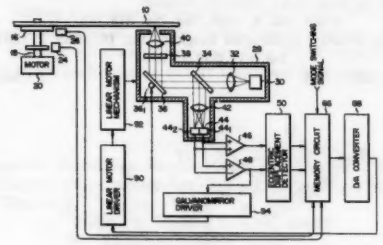
computer means for controlling said control means.

4,527,263

ECCENTRICITY CORRECTION FOR AN OPTICAL DISK DEVICE

Akira Nakagawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 1, 1982, Ser. No. 394,305
Claims priority, application Japan, Jul. 7, 1981, 56-105935
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—46 **4 Claims**



1. An optical disk device comprising:

a turntable for rotating an optical disk having at least one substantially circular recording track;

optical head means, linearly movable along the radial direction of a rotating optical disk placed on said turntable for recording data on and reading data from said track using a laser beam and generating an optical head signal containing eccentric displacement information;

revolution detecting means for detecting at least one revolution of said optical disk;

pulse generating means for generating a plurality of pulses at equal time intervals in correspondence with first predetermined equal angular intervals of said at least one revolution of said optical disk;

eccentric displacement detecting means for detecting from said optical head signal an eccentric displacement of said optical disk and for producing eccentric displacement compensating data indicative thereof; wherein said eccentric displacement detecting means comprises: a light-receiving unit having first and second light-receiving elements which are adjacent to each other and which receive light beams relfected by said optical disk and photoelectrically convert the light beams to electric signals, respectively; an adder, connected to said light-receiving unit, for adding the electric signals from said first and second light-receiving elements; a differential amplifier, connected to said light-receiving unit, for generating an output representing a difference between the electric signals from said first and second light-receiving elements; and an eccentric displacement detector, connected to said adder and said differential amplifier, for generating a first signal representing a recording track over which the laser beam crosses and a second signal representing a crossing direction of the laser beam in response to the outputs from said adder and said differential amplifier, said first and second signals representing eccentric displacement;

memory means, connected to said eccentric displacement detecting means, said revolution detecting means and said pulse generating means, for storing the eccentric displacement data in correspondence with second predetermined equal angular intervals of said optical disk on the basis of the plurality of pulses from said pulse generating means and a signal from said revolution detecting means; and

driving means, connected to said memory means, for controlling a position of said optical head means to compensate for the eccentric displacement of said disk accordance with the eccentric displacement compensating data read from said memory means in correspondence with the

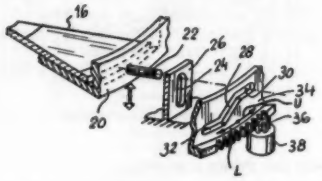
second predetermined equal angular intervals of said optical disk when data is recorded on the optical disk or reproduced therefrom.

4,527,264

COMPACT DISC LOADING AND UNLOADING DEVICE WITH ROTATIONALLY ACTUATED MOVABLE DISC SUPPORT

Stephane d'Alayer de Costemore d'Arc, Brussels, Belgium, assignor to Staar S.A., Brussels, Belgium

Filed Jun. 8, 1984, Ser. No. 618,741
Claims priority, application Belgium, Jul. 19, 1983, 211201
Int. Cl.³ G11B *17/04*
U.S. Cl. 369—77.1 **3 Claims**



1. In a loading and unloading device for disc recording/-playback apparatus, said device having a frame, a disc support movably mounted on the frame for movement of the disc along its axis between a loading position and an operating position, the improvement comprising:

a plurality of studs extending laterally from said movable disc support,

elements fastened to the frame providing a plurality of straight guide slots extending parallel to said axis of the disc for receiving said studs and guiding the movement of said disc support,

a ring member mounted on the frame for rotational movement about the axis of the disc and having a plurality of oblique slots, each intersecting one of said straight slots and each of said studs extending through a pair of slots where they intersect, and

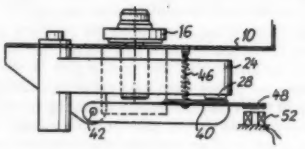
means for rotating said ring member in one direction or the reverse direction through a restricted rotational distance to move said studs along said straight guide slots by the engagement of the edges of said oblique slots against said studs and move said disc support in one direction or the reverse direction between said loading and unloading positions of the disc.

4,527,265

POSITION MEMORY FOR LASER REPRODUCTION UNIT

Stéphane A. M. d'Alayer de Costemore d'Arc, Ways, Belgium, assignor to Staar S. A., Brussels, Belgium

Filed May 10, 1984, Ser. No. 608,878
Claims priority, application Belgium, Jun. 30, 1983, 211088
Int. Cl.³ G11B *17/00*
U.S. Cl. 369—244 **9 Claims**



1. In a record player apparatus having a laser reproduction unit and a movable support for moving said reproduction unit across the surface of a record as the record is rotated during a playing operation to position the reproduction unit to reproduce recordings in tracks on the records, and a switch for controlling the power supply to said apparatus, the improvement comprising:

means including a memory unit for storing identification information read by said reproduction unit from tracks on the record, said memory unit including a non-volatile memory to retain said information when the power supply is cut off by actuation of said switch and the reproducing is interrupted while the record is being rotated during a playing operation; and

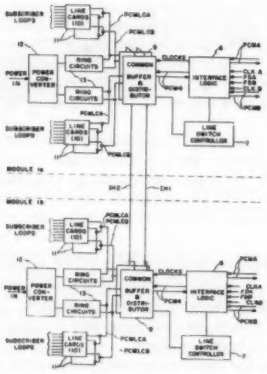
means for locating the reproduction unit in the position occupied when the power supply was cut off to resume the reproducing at the point of interruption when the power supply is reconnected by actuation of said switch.

4,527,266

INTERFACE CIRCUIT FOR USE IN A DISTRIBUTED PROCESSING SWITCH UNIT

Leonard E. Bogan, and Richard A. Hamersley, both of Columbus, Ohio, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,915
Int. Cl.³ H04J *3/02*; H04Q *11/04*
U.S. Cl. 370—58 **29 Claims**



1. An interface circuit arrangement interfacing a processor to one or more time division multiplexed buses carrying PCM information and control information, said processor having a bidirectional data bus, an interrupt input, and control outputs, said interface circuit comprising:

a first set of terminals coupled to one of said time division multiplexed buses;

a first clock terminal for receiving bit clock signals;

a second clock terminal for receiving framing clock signals;

a data terminal coupled to said data bus;

an interrupt terminal coupled to said interrupt input;

control terminals coupled to said control outputs;

first timing means coupled to said first and second clock terminals for generating first control signals in response to said framing clock signals and said bit clock signals;

first register means coupled to said first set of terminals and responsive to said first control signals for storing said control information;

address match means coupled to said first register means for comparing said stored control information to a predetermined address information and coupled to said interrupt terminal for generating an interrupt signal when said

stored control information corresponds to said predetermined address information; and

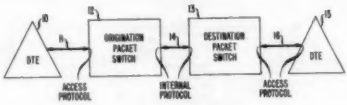
means responsive to first predetermined control signals at said control terminals and first predetermined command information at said data terminal for coupling said first register means to said data terminal whereby said stored control information is transmitted to said processor.

4,527,267

METHOD OF ADMINISTERING LOCAL AND END-TO-END ACKNOWLEDGMENTS IN A PACKET COMMUNICATION SYSTEM

Karen L. Cohen, Brooklyn, N.Y., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 9, 1982, Ser. No. 396,677
Int. Cl.³ H04Q *11/04;* **H04J** *3/00, 6/00*
U.S. Cl. 370—60 **29 Claims**



1. A method of administering the communication of acknowledgment packets under control of an access protocol for data packets received by said protocol from an originating link, comprising

receiving from said originating link a data packet having an information bit specifying a local or end-to-end acknowledgment request and a packet send sequence number,

setting a memory table using said packet send sequence number as an index and said information bit as a value,

transferring the received packet to an internal protocol for communication through a packet switch network to a destination link, and

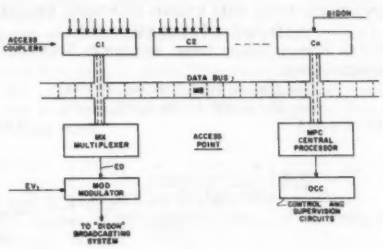
checking the set memory table to determine permission to send an acknowledgment packet to said originating link.

4,527,268

STRUCTURE OF AN ACCESS POINT TOWARD A DATA PACK BROADCASTING NETWORK

Guy P. Dublet, Rennes, France, assignor to Etablissement Public de Diffusion dit "Telediffusion de France", Montrouge, France

Filed Aug. 12, 1983, Ser. No. 522,816
Claims priority, application France, Aug. 31, 1982, 82 15139
Int. Cl.³ H04J *3/00, 6/00*
U.S. Cl. 370—94 **11 Claims**



1. An access point structure for a network which broadcasts data packet, said access point comprising a plurality of coupler means, buffer memory means, and central control means all being interconnected by a main bus; means for coupling the buffer memory means to data packet transmission equipment of the broadcasting network;

each of said coupler means including dual access memory means, microprocessor means, read only memory means, and a plurality of access circuits all being interconnected by a local bus, each of said access circuits being connected to a data source means, means in each of said coupler means for storing coupler control software and a set of subroutines for exchanging information with the buffer memory means; and

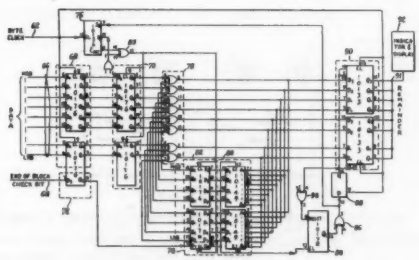
switching memory means in the central control means for storing a connection table relating to a sequence for establishing time-division switched connections between said coupler means, and the buffer memory means, and for storing subroutines for controlling interconnections between each coupler and its associated data source.

4,527,269

ENCODER VERIFIER

Roger W. Wood, San Joaquin, Calif., and Charles L. Matson, Dayton, Ohio, assignors to Ampex Corporation, Redwood City, Calif.

Filed Feb. 8, 1983, Ser. No. 464,845
Int. Cl.³ G06F *11/12*
U.S. Cl. 371—3 **9 Claims**



1. An encoder verifier for checking the functioning of an encoder in which data and parity bytes are intended to be digitally encoded in data blocks to form for each data block a respective codeword in multi-bit bytes in the form of a Galois field polynomial that is divisible in the Galois field by a generator polynomial, such generator polynomial being the Galois field product of a plurality of factors, said encoder verifier comprising: polynomial dividing means responsive to codewords for polynomial division in a Galois field of respective codewords by only one of said factors to produce a remainder signal systematically related to the remainder from such division, and indicator means responsive to a said remainder signal corresponding to a remainder signal other than zero for producing an indication of encoder malfunction.

4,527,270

COMMUNICATIONS NETWORK WITH STATIONS THAT DETECT AND AUTOMATICALLY BYPASS FAULTS

David C. Sweeton, Cleveland Heights, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed May 4, 1983, Ser. No. 491,550
Int. Cl.³ G06F *11/20;* **H04Q** *9/00*
U.S. Cl. 371—11 **6 Claims**

1. In a communication network having a plurality of station nodes connected together in a ring configuration by a primary data link which conveys data around the ring from station to station in one direction and a secondary data link which conveys data around the ring from station to station in the other direction, an improved station which comprises:

a primary receiver connected to the primary data link to receive data from a predecessor station on the network;

a primary transmitter connected to the primary data link to transmit data to a successor station on the network;

a secondary transmitter connected to the secondary data link to transmit data to the predecessor station on the network;

a secondary receiver connected to the secondary data link to receive data from the successor station on the network;

a predecessor monitor connected to the primary receiver and the secondary transmitter, said predecessor monitor being operable:

(a) to detect poor data quality at the primary receiver;

(b) to detect the receipt of abort data by the primary receiver; and

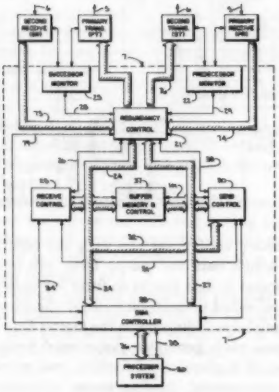
(c) to generate a first error signal when either of the conditions in (a) or (b) is detected; and

a successor monitor connected to the primary transmitter and the secondary receiver, said successor monitor being operable:

(d) to detect poor data quality at the secondary receiver;

(e) to detect the receipt of abort data by the secondary receiver; and

(f) to generate a second error signal when either of the conditions in (d) or (e) is detected; and



a redundancy control circuit connected to the predecessor monitor and the successor monitor, the redundancy control circuit being responsive to the generation of the first or second error signals to control the mode of operation of the station and to thereby direct the conveyance of message data between the station and the predecessor and successor stations;

when the station is in mode one message data is received by the primary receiver and transmitted by the primary transmitter, the secondary receiver receives data from the successor station, and the secondary transmitter transmits delimiter data to the predecessor station;

where the station is switched to mode four when the first error signal is generated and all message data is received at the secondary receiver and transmitted by the primary transmitter; and

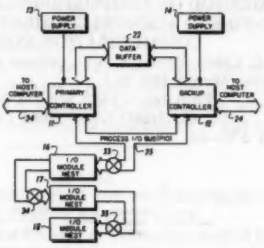
where the station is switched to mode three when the second error signal is generated and all message data is received at the primary receiver and transmitted by the secondary transmitter.

4,527,271

PROCESS CONTROL SYSTEM WITH IMPROVED FAULT ISOLATION

Donald O. Hallee, North Easton; Harold Lake, Sharon; Kenneth L. Johansson, North Grafton, and Thomas B. Graves, Norton, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Aug. 17, 1982, Ser. No. 408,967
Int. Cl.³ G06F *9/22, 11/00*
U.S. Cl. 371—20 **24 Claims**



1. In a control system for providing direct digital control over an industrial process of the type having a digital controller communicating with a plurality of sensors and actuators located within a process field area, said controller including in a first location a central processing unit and associated data storage means for performing operations respecting the condition of said process and in a second location an input/output connector housing area for holding a plurality of input/output modules that receive and send field signals to and from said sensors and actuators, said controller further including a communications bus linking said first and second locations such that said input/output modules are connected in parallel along said bus when inserted in said connector housing area, the improvement in said control system for detecting and isolating failures within said controller comprising:

means for detecting a fault condition within said controller;

means responsive to said detector means for providing an indication of said fault condition;

means for isolating said fault condition between either said first location or said second location;

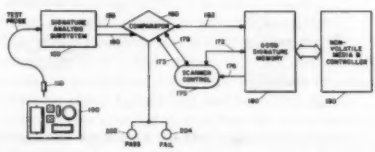
said means for isolating including means for rapidly disconnecting said input/output modules from said first location, whereby the absence or continuance of said fault indication pinpoints whether said fault condition is in said first or second location.

4,527,272

SIGNATURE ANALYSIS USING RANDOM PROBING AND SIGNATURE MEMORY

Michael G. Reiney, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 6, 1982, Ser. No. 446,907
Int. Cl.³ G01R *31/28;* **G06F** *11/00*
U.S. Cl. 371—25 **5 Claims**



1. A method for testing an electronics assembly using an electronic tester, said method comprising the steps of:

providing a set of data codes representing acceptable responses at a plurality of predetermined test points for

testing stimulus signals provided to an operable electronic assembly of the type under test;

generating a first data code in response to a testing operation on one of said plurality of predetermined test points in said electronic assembly under test;

comparing said first data code to said set of data codes to determine if an equivalent data code is contained therein; and

providing a test result indication in response to the comparison of said first data code to said set of data codes.

4,527,273

MAGNETIC DISC DEVICE

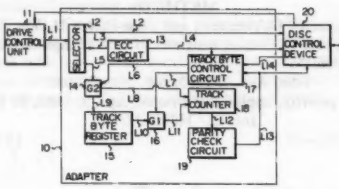
Yasumori Hibi, Chigasaki, and Hideo Matsuura, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 18, 1982, Ser. No. 434,889

Claims priority, application Japan, Oct. 21, 1981, 56-168338

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—38 **3 Claims**



3. An information processing system, comprising:

a central processing unit;

a disc control device operatively connected to said central processing unit;

a drive control unit including a disc for storing records, each record including track bytes; and

an adapter, comprising:

a selector operatively connected to said drive control unit and said disc control device;

an error code checking circuit, operatively connected to said selector and said disc control device, for checking the track bytes read from said disc for errors;

a first gate operatively connected to said selector;

a track byte register, operatively connected to said first gate, for storing the track bytes when they are correct and supplying the track bytes stored in said track byte register as the track bytes of said records if said records are re-read;

a second gate operatively connected to said track byte register;

a track counter operatively connected to said first and second gates;

a parity check circuit operatively connected to said track counter and said disc control device; and

a track byte control circuit, operatively connected to said disc control device, said parity check circuit and said first and second gates, for controlling said first and second gates.

4,527,274

VOICE SYNTHESIZER

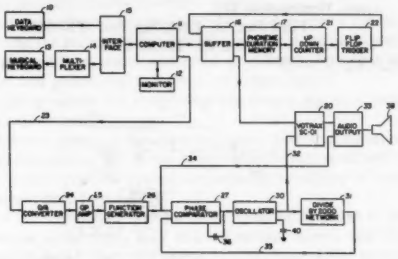
Ronald E. Gaynor, 85-55 Little Neck Pkwy., Floral Park, N.Y. 11001

Filed Sep. 26, 1983, Ser. No. 535,609

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—51 **20 Claims**

1. A voice synthesizer for simulating a voice singing the lyrics of a song comprising: a speech synthesizer for electronically producing spoken words in response to coded signals representing word syllables; record means for storing coded signals representative of the syllables of the words of a song; data keyboard means for entering coded signals representative of the syllables of the words of a song into said record means; musical keyboard means for playing the notes of a melody; means responsive to said musical keyboard means for transferring coded signals from said record means to said speech synthesizer, said responsive means transferring one coded syllable signal for each musical note played; and pitch control means responsive to the musical note played by said musical keyboard means for controlling the pitch at which said speech synthesizer produces the syllables of the words of a song.



4,527,275

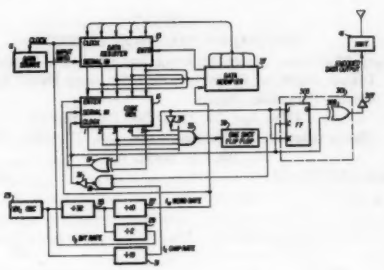
CORRELATION DATA COMMUNICATIONS SYSTEM

James L. Russell, Germantown, Md., assignor to Arinc Research Corporation, Annapolis, Md.

Continuation-in-part of Ser. No. 348,425, Feb. 12, 1982, Pat. No. 4,477,912. This application Jun. 21, 1982, Ser. No. 390,702

Int. Cl.³ H04K *1/04*; H04L *27/10*

U.S. Cl. 375—1 **21 Claims**



19. A minimum shift keying data encoding system comprising:

means for supplying a clock signal having a given frequency;

means for supplying binary code words;

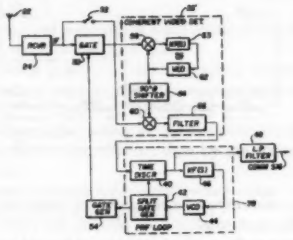
means coupled to said clock signal supplying means and to said binary code word supplying means for forming a differential code signal output from supplied binary code words in response to said clock signal at said given frequency; and,

means coupled to the output of said differential code signal forming means and to said clock signal supplying means for phase shift coding said clock signal having said given frequency with said differential code signal.

4,527,276
DIGITAL PULSE POSITION MODULATION COMMUNICATIONS SYSTEM WITH THRESHOLD EXTENSION

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 16, 1984, Ser. No. 571,301
Int. Cl.³ H03K 9/04
U.S. Cl. 375—23 **14 Claims**



1. In a digital pulse position modulation communications system including receiver means responsive to RF signals including a pulse position modulation communication signal transmitted from a communications signal source, coherent signal detector means responsive to IF pulse position modulation communications signals generated by said receiver means comprising:

quadrature phase type coherent video detector means coupled to said receiver means and being operable to generate envelope detected video pulse position modulated communication signals in response to said IF pulse position modulated communications signals;

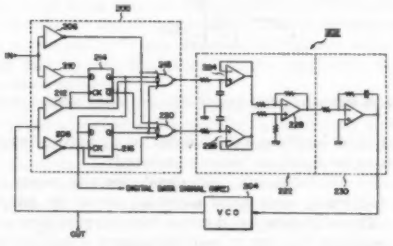
a split gate prf loop, coupled to said coherent video detector means and operating as a coherent signal detector in response to said envelope detected video pulse position modulated communications signals; and

signal filter means coupled to said prf loop for providing an output comprising said communications signal.

4,527,277
TIMING EXTRACTION CIRCUIT

Takashi Kosaka; Takamasa Koga, and Kuniyoshi Konishi, all of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 20, 1983, Ser. No. 486,834
Claims priority, application Japan, Apr. 21, 1982, 57-65450
Int. Cl.³ H04L 7/02
U.S. Cl. 375—82 **12 Claims**



1. A timing extraction circuit comprising:

a data input terminal for receiving a digital data signal of one selected RZ or NRZ line code;

a clock output terminal to which a timing signal is supplied;

phase comparing means for dividing a pulse of said digital data signal into leading and following portions in response to said timing signal fed back from said clock output terminal and for producing first and second difference signals having variable pulse durations respectively corresponding to the pulse widths of said leading and following portions; and

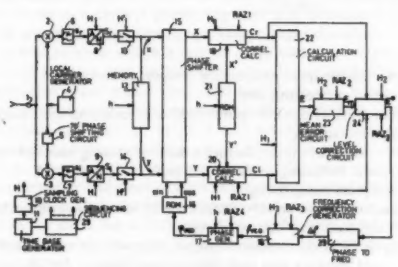
control means for generating a phase error signal corresponding to the difference between the pulse durations of said first and second difference signals; and

variable frequency oscillating means for supplying a timing signal to said clock output terminal, the period of said timing signal being controlled in accordance with said phase error signal to decrease the difference in pulse width between said leading and following portions.

4,527,278
METHOD FOR CORRECTING THE FREQUENCY OF A LOCAL CARRIER IN A RECEIVER OF A DATA TRANSMISSION SYSTEM AND RECEIVER USING THIS METHOD

Alain Deconche, Guyancourt, and Jean-Pierre H. Van Uffelen, Rungis, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1983, Ser. No. 483,085
Claims priority, application France, Apr. 9, 1982, 82 06289
Int. Cl.³ H04L 27/16
U.S. Cl. 375—97 **11 Claims**



1. A method for correcting the frequency of a local carrier in a receiver of a data transmission system in which data are transmitted by carrier modulation and a receiver synchronizing word is transmitted before the data, said receiver comprising means for demodulating a received signal with the aid of signals in phase and in quadrature with a local carrier, means for sampling the in-phase and quadrature demodulated signals with a sampling frequency equal to the modulation rate, each new pair of in-phase and quadrature samples thus formed being written into a received-signal memory, the receiver further comprising a synchronizing-word memory containing in-phase and quadrature samples of a local synchronizing word which is identical to the transmitted synchronizing word, the method comprising:

effecting at least once during each sampling period the synchronized reading of n pairs of samples contained in the synchronizing word memory and n pairs of samples written last into the received-signal memory in order to determine in P steps ($P \geq 1$) the magnitude of the frequency correction to be effected on the local carrier;

during each step calculating from said read samples at least one pair of in-phase partial correlations $C_r(k-1)$, $C_r(k)$ and at least one pair of quadrature partial correlations $C_i(k-1)$, $C_i(k)$, the partial correlations of order $(k-1)$ and (k) in each step employing two consecutive portions of the same length of the local synchronizing word, the partial correlations of each step of the order of $p>1$ using portions of the synchronizing word of a length which exceeds the length of the portions used during the preceding step

of the order p-1, the partial correlations of the step of the order p being calculated while taking account of the frequency correction calculated at the end of the preceding step p−1;

during each step calculating at least one quantity $E=C_r(k-1)\cdot C_i(k)-C_i(k-1)\cdot C_r(k)$ which is corrected as a function of the level of the received signal so as to supply a corrected quantity E*, which is a predetermined function

$$E^* = \sin \Delta\phi \cdot \left[\frac{\sin \frac{\Delta\phi}{2}}{b \sin \frac{\Delta\phi}{2b}} \right]^2$$

of the phase deviation $\Delta\phi$ produced by the frequency deviation Δf between the local carrier and the received carrier, during a time interval corresponding to the number of bits b which form the length of the said portions of the synchronizing word;

at the end of each step $p \geqq 1$ calculating from at least one corrected quantity E*, which is formed during the step and which is of the same length as the portions of the synchronizing word used during the step, the frequency deviation Δf_p, and thereafter forming the sum

$$\sum_{i=1}^{p} \Delta f_i$$

which constitutes an estimate of the magnitude of the frequency correction, this estimate at the end of the step P being the final value to be retained for the magnitude of the frequency correction to be effected on the local carrier.

4,527,279

SYNCHRONIZATION CIRCUIT FOR A VITERBI DECODER

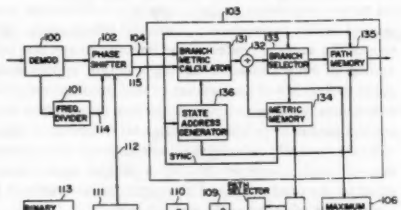
Yutaka Yasuda; Yasuo Hirata; Shuji Murakami; Katsuhiro Nakamura, and Yukitsuna Furuya, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co. and NEC Corporation, both of Tokyo, Japan

Filed Jul. 6, 1983, Ser. No. 511,774

Claims priority, application Japan, Jul. 12, 1982, 57-120944; Jul. 12, 1982, 57-120946

Int. Cl.³ H04L *7/04*

U.S. Cl. 375—114 **5 Claims**



1. A synchronization circuit for a viterbi decoder adapted to receive a bit stream of code words and having means for deriving a word synchronization signal from said bit stream, said Viterbi decoder having means for deriving from said bit stream an address code identifying each state of the decoder in a trellis diagram and means for deriving a metric value from said address code, said synchronizing circuit comprising:

a phase shifter responsive to said bit stream and to said word synchronization signal for introducing a delay time to one of said bit stream and said word synchronization signal in response to a control signal applied thereto;

first detecting means for detecting a maximum of said derived metric values;

a memory for storing therein said derived address codes and said detected maximum metric values;

second detecting means connected to said memory for detecting the presence of a path between the states addressed by the address codes generated at different locations in time and generating therefrom an output signal;

integrating means for integrating the output signal of said second detecting means;

third detecting means for detecting when an output signal of said integrating means reaches a value indicative of either a word-in-sync or a word-out-of-sync condition of said Viterbi decoder; and

means for generating a phase shift signal in response to an output signal from said third detecting means and for applying said phase shift signal to said phase shifter as said control signal.

4,527,280

FREQUENCY SYNTHESIZING TYPE ELECTRONIC TUNER

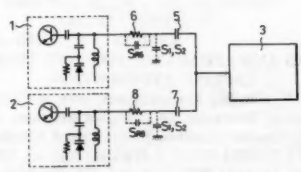
Sadayoshi Ijichi, and Masaki Yamamoto, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Oct. 13, 1983, Ser. No. 541,553

Claims priority, application Japan, Oct. 13, 1982, 57-154662[U]

Int. Cl.³ H04B *1/26;* **H03L** *7/18*

U.S. Cl. 455—183 **2 Claims**



1. In a phase locked loop frequency synthesizer type electronic tuner comprising a plurality of local oscillators operable in frequency bonds different from each other, only one of said local oscillators being operable in accordance with a selected reception frequency band, and a coupling circuit connecting outputs of the local oscillators to a prescaler, said coupling circuit including a respective series connected resistor/capacitor pair associated with each of said oscillators the improvement wherein the resistors in said resistor/capacitor pairs are connected so as to be electrically adjacent to the local oscillators and the capacitors in said resistor/capacitor pairs are connected so as to be electrically adjacent to the prescaler.

4,527,281

AUTO-SCAN CHANGEOVER SYSTEM FOR TWO-BAND RADIO RECEIVER EMPLOYING PLL FREQUENCY SYNTHESIZERS

Toshiyuki Imagawa, and Kazuya Ohara, both of Saitama, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,746

Claims priority, application Japan, Oct. 27, 1982, 57-188587

Int. Cl.³ H03J *7/18*

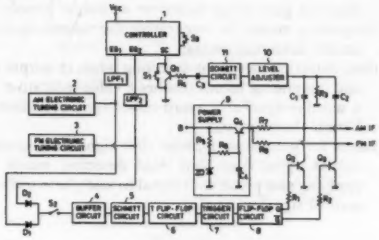
U.S. Cl. 455—165 **3 Claims**

1. An auto-scan changeover system for a two-band radio receiver employing PLL (phase-locked loop) frequency synthesizers, said system comprising:

first and second PLL frequency synthesizers for first and second broadcasting bands, respectively;

first detecting circuit responsive to a tuning frequency scanning signal from said respective synthesizers to detect completion of a scanning operation of said first or second broadcasting band;

first switching circuit responsive to a detection signal from said first detecting circuit to switch a power supply between first and second broadcasting band reception circuits in said radio receiver so as to render said first or second broadcasting band reception circuit operative for reception;



second detecting circuit for detecting that said first switching circuit switched said power supply to said first or second broadcasting band reception circuit;

first and second scanning circuits associated with said first and second broadcasting bands, respectively, to control said first and second synthesizers; and

second switching circuit responsive to a detection signal from said second detecting circuit to actuate said first or second scanning circuit.

4,527,282

METHOD AND APPARATUS FOR LOW FREQUENCY ACTIVE ATTENUATION

George B. B. Chaplin; Andrew Jones, both of Colchester, and Owen Jones, Doncaster, all of United Kingdom, assignors to Sound Attenuators Limited, Essex, United Kingdom

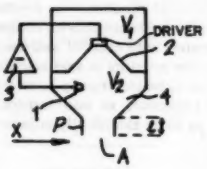
PCT No. PCT/GB82/00250, § 371 Date Apr. 11, 1983, § 102(e) Date Apr. 11, 1983, PCT Pub. No. WO83/00580, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 10, 1982, Ser. No. 491,324

Claims priority, application United Kingdom, Aug. 11, 1981, 8124567

Int. Cl.³ G10K *11/16*; F16L *55/02*

U.S. Cl. 381—71 **10 Claims**



1. A method of attenuating low frequency gas-borne primary vibrations using the virtual earth system comprising locating a pressure microphone (1) in the near field of a driver (2), enclosing the microphone (1) in an acoustically partially closed volume (4) whose largest dimension is smaller than the wavelength of the highest frequency of the primary vibration to be nulled, and introducing the primary vibrations into the said partially closed volume and linking the pressure microphone to the driver (2) by an amplifier (3) in a feed-back loop whereby the driver produces an output in the form of gas-borne secondary vibrations which attenuate the primary vibrations in the vicinity of the microphone and produce a null pressure at the microphone (1).

4,527,283

CHARACTER INFORMATION SEPARATING APPARATUS FOR PRINTED CHARACTER READING SYSTEMS

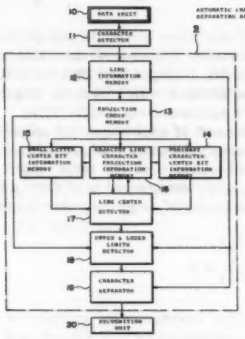
Koji Ito, Kanagawa; Masanori Onishi, Chiba, and Hisao Hayashi, Tokyo, all of Japan, assignors to Tokyo Keiki Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 236,600, Feb. 20, 1981, abandoned. This application Dec. 7, 1983, Ser. No. 558,911

Claims priority, application Japan, Feb. 26, 1980, 55-23133

Int. Cl.³ G06K *9/34*

U.S. Cl. 382—9 **6 Claims**



1. In an apparatus wherein character information obtained by reading groups of characters printed on a line and having a predetermined size and a character stroke width, said characters read from a source document are thereafter separated character by character prior to a recognition process, the improvement comprising:

first means for storing said character information in an amount corresponding to the width of approximately one and a half lines on the document;

second means for dissecting linewise the information stored in said first means into a plurality of blocks each having a line length corresponding to two character spacings and for producing a linewise projection information for each of said dissected blocks;

third means responsive to the projection information in said second means to produce a center bit information indicative of the vertical center of the linewise projection information of each character having a height approximately equal to ½ to 5/4 of a character of said predetermined size;

fourth means responsive to the projection information in said second means to produce a center bit information indicative of a vertical center of the linewise projection information of each character having a height approximately equal to the predetermined character stroke width to ½ of a character of said predetermined size;

fifth means responsive to the projection information in said second means to produce the linewise projection information of the projection information of preceding and following lines of an intended line;

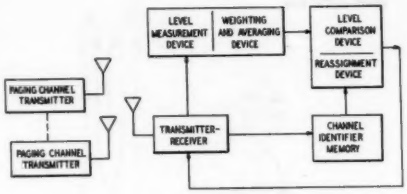
sixth means for combining the information in said third, fourth and fifth means to detect a line center position information of said intended line; and

seventh means responsive to the information in said sixth means to perform line separation of said intended line from the information in said second means or said first means.

4,527,284
ADJACENT RADIO CELLS PAGING CHANNEL CHAINING SYSTEM

Klaus Röttger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 22, 1982, Ser. No. 452,310
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1982, 3200965
Int. Cl.³ H04Q 7/02; H04B 7/76
U.S. Cl. 455—33 **8 Claims**



1. A neighboring radio cell paging channel chaining system for cellular mobile radio networks having a plurality of adjacent radio cells and at least one mobile station, and in which paging channels have free transmission capacity and respective specified frequencies, comprising:

first means in each radio cell for transmitting, in the free transmission capacity of at least one paging channel, paging channel frequency identifiers of the paging channels of the adjacent neighboring radio cells;

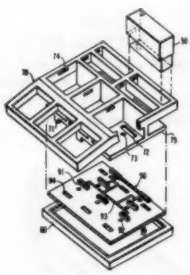
second means in the mobile radio station operable to carry out level measurements at chronological intervals on the specified paging channel frequencies; and

third means in the mobile radio station operable to compare the measured levels with the level of the paging channel being employed by the mobile radio station and reassign the mobile radio station to a neighboring radio cell when the paging channel of the neighboring radio cell has a better quality of radio connection than the presently assigned radio cell.

4,527,285
PLUGGABLE TERMINAL ARCHITECTURE

Dennis H. Kekas; George R. Stilwell, Jr., both of Raleigh; Robert M. Walsh, Cary, and Roger C. Williams, Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,681
Int. Cl.³ H04B 9/00
U.S. Cl. 455—607 **12 Claims**



1. An interactive modular terminal including:

a. a frame having a plurality of openings therein, said openings being operable for orienting and retaining one or more self-contained functional units with some of the units being operable for interfacing with a human operator to provide communication of information between the functional units and the operator,

b. one or more self-contained functional units, operable to perform an included function, being fitted in the openings and being supported in said frame with each of said self-contained functional units having:

(1) a signal transceiver for receiving and transmitting data signals,

(2) a logic unit for processing received signals to cause the included function to be performed,

(3) a power tap for transferring power to said signal transceiver and said logic unit,

c. a data distribution chamber in communication with the signal transceivers of each self-contained functional unit for providing a communications medium linking each functional unit with at least one other functional unit, and

d. a power distribution means for distributing power among one or more of said self-contained functional units and including:

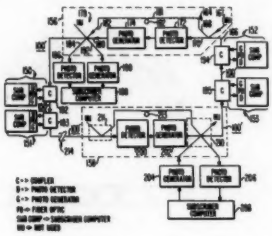
(1) a pattern of current conductors and adapted to be conductively connected to said power taps,

(2) one or more openings being positioned in the power distribution means and operable to form a signal communicating path between the data distribution chamber and the signal transceivers.

4,527,286
REPEATER FOR FIBER OPTIC BUS DISTRIBUTION SYSTEM

Robert F. Haworth, Somerdale, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 20, 1982, Ser. No. 451,429
Int. Cl.³ H04B 9/00
U.S. Cl. 455—601 **1 Claim**



1. An improved high-reliability fiber-optic repeater for regeneration of signals on a fiber-optic bus adapted for feeding a plurality of subscriber stations, said repeater comprising: a four-port star coupler including an input port adapted to be coupled to an upstream portion of said fiber-optic bus for receiving therefrom an input signal, a second unused input port, and first and second output ports to which first and second portions of the power of said input signal are coupled, respectively;

a photodetector-photogenerator regenerator pair including an input port coupled to said first output port of said four-port star coupler for receiving said first portion of said power of said input signal, and also including an output port at which a regenerated signal is generated, said regenerated signal having a first delay relative to said input signal;

a second star coupler including first and second input ports and first and second output ports, said first input port being coupled to said output port of said regenerator pair for receiving said regenerated signal therefrom and for coupling said regenerated signal to said first output port,

said second output port of said second star coupler being unused, and said first output port of said second star coupler being adapted for coupling to a downstream portion of said fiber-optic bus;

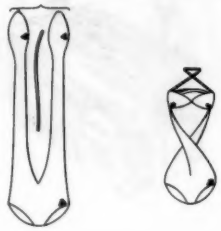
a fiber-optic cable coupled to said second output port of said four-port star coupler and to said second input port of said second star coupler for coupling said second portion of said input signal to said first output port of said second star coupler, said fiber-optic cable having a second delay equal to said first delay whereby said repeater has no provision for coupling to a subscriber station;

wherein the improvement lies in that said second star coupler is a six-port star coupler including a third input terminal and a third output terminal adapted to be coupled to a subscriber generator and a subscriber detector, respectively, whereby said subscriber detector receives said regenerated signal during those intervals in which said regenerator is operative and otherwise receives non-regenerated signals by way of said fiber-optic cable with less loss than if said second star coupler were a four-port star coupler and said subscriber were coupled by a third four-port star coupler to said downstream portion of said fiber-optic bus.

DESIGNS

JULY 2, 1985

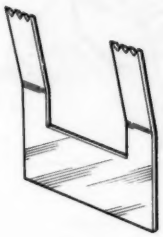
279,420
SWIMMING SUIT
Vicki L. A. Johnson, 292 S. 300 West, Payson, Utah 84651
Continuation-in-part of Ser. No. 142,792, Apr. 22, 1980, Pat. No. Des. 268,542. This application Feb. 7, 1983, Ser. No. 464,561
Term of patent 14 years
U.S. Cl. D2—40



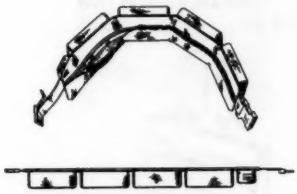
279,421
MOTHER'S NURSING BIB
Bonnie H. Colberg, 133 Morehead Dr., and Kathy E. Ellis, 3902 Willow Wood Rd., both of Martinez, Ga. 30907
Filed Apr. 1, 1983, Ser. No. 481,493
Term of patent 14 years
U.S. Cl. D2—226

279,422
SHOE AND THE LIKE
Steven M. Foldes, Conyngham, Pa., assignor to Fun Footwear Co., West Hazleton, Pa.
Filed Oct. 31, 1984, Ser. No. 666,690
Term of patent 14 years
U.S. Cl. D2—291

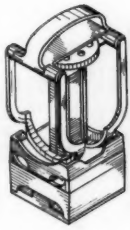
279,423
SECURITY CLIP FOR PREVENTING THEFT AND ACCIDENTAL WALLET LOSS
Frank Zucker, 501 Anita St., Sp. 46, Chula Vista, Calif. 92011
Filed Dec. 28, 1982, Ser. No. 436,565
Term of patent 14 years
U.S. Cl. D2—378



279,424
BATTERY BELT
Steven G. Leiserson, 9190 Manor Dr., La Mesa, Calif. 92041, and Noel Wren, 10312 Holly St., Alta Loma, Calif. 92701
Filed Dec. 6, 1982, Ser. No. 447,336
Term of patent 14 years
U.S. Cl. D2—381



279,425
CARRIER FOR SKI EQUIPMENT
John M. Crump, 1018 Parkridge Cir. West, Jacksonville, Fla. 32211
Filed Jun. 14, 1982, Ser. No. 387,965
Term of patent 14 years
U.S. Cl. D3—36



279,426
SUPPORT FOR MOUNTING RADIOS IN A VEHICLE HAVING BUCKET SEATS
Stephen Dzak, 414 Muir Dr., Lockport, Ill. 60441
Filed Sep. 24, 1982, Ser. No. 422,982
Term of patent 14 years
U.S. Cl. D3—40

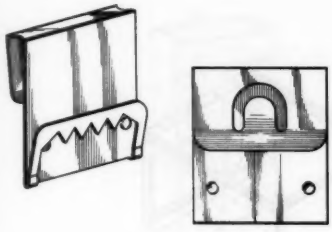
279,427
HOLSTER PURSE
Gerald Emery, R.D. 1, Rte. 31, Lebanon, N.J. 08833
Filed Feb. 7, 1983, Ser. No. 464,625
Term of patent 14 years
U.S. Cl. D3—42

279,428
COMBINED CARRYING CASE AND FOLDING MAT
Suzanne Thomas, So. Hackensack, N.J., assignor to La Rue Distributors, Inc., New York, N.Y.
Filed Sep. 20, 1983, Ser. No. 533,868
Term of patent 14 years
U.S. Cl. D3—43

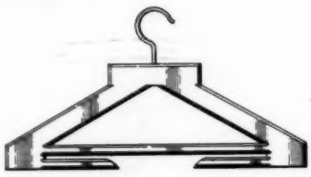
279,429
LUGGAGE ARTICLE FRONT PANEL
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Kidde, Inc. (Presto Lock Company Division), Garfield, N.J.
Filed Mar. 5, 1981, Ser. No. 240,847
Term of patent 14 years
U.S. Cl. D3—76

279,430
CHAIR
Gerald D. McLeroy, 2807 Via Montecito, San Clemente, Calif. 92672
Filed Jun. 21, 1982, Ser. No. 390,765
Term of patent 14 years
U.S. Cl. D6—358

279,431
PICTURE FRAME HANGER-CLIP
Christopher C. Sutherland, South Attleboro, Mass., assignor to Craft, Inc., South Attleboro, Mass.
Filed Feb. 10, 1983, Ser. No. 465,476
Term of patent 14 years
U.S. Cl. D6—300



279,432
GARMENT HANGER
Louis A. Webber, 4558 Rueda St., San Diego, Calif. 92124
Filed Jan. 3, 1983, Ser. No. 455,364
Term of patent 14 years
U.S. Cl. D6—319



279,433
PICNIC TABLE
Donald N. Fuchs, 1007 Second St. South, Cold Spring, Minn. 56320
Filed Apr. 29, 1983, Ser. No. 489,760
Term of patent 14 years
U.S. Cl. D6—337

279,434
BICYCLE SEAT COVER
Thomas C. Silva, 1312 Missouri St., San Diego, Calif. 92109
Filed Jan. 3, 1983, Ser. No. 455,189
Term of patent 14 years
U.S. Cl. D6—354

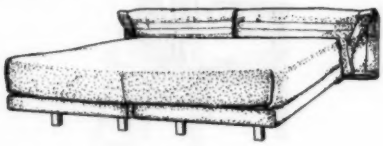
279,435
ARM-CHAIR
Carlo Giorgetti, Milan, Italy, assignor to Giorgetti S.p.A., Milan, Italy
Filed Mar. 16, 1983, Ser. No. 475,850
Claims priority, application Italy, Sep. 16, 1982, 22912/82[U]
Term of patent 14 years
U.S. Cl. D6—370

279,436
ARM-CHAIR
Carlo Giorgetti, Milan, Italy, assignor to Giorgetti S.p.A., Milan, Italy
Filed Mar. 16, 1983, Ser. No. 475,879
Claims priority, application Italy, Sep. 16, 1982, 22912/82[U]
Term of patent 14 years
U.S. Cl. D6—370

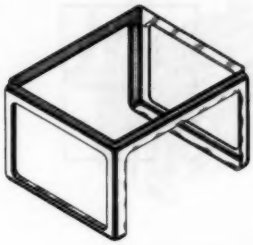
279,437
BUCKET SEAT
William P. Downey, Jr., Winston-Salem, N.C., assignor to Fairchild Industries, Inc., Chantilly, Va.
Filed Mar. 23, 1983, Ser. No. 478,110
Term of patent 14 years
U.S. Cl. D6—375

279,438
CHAIR
James L. Gerner, Mission, Kans., assignor to Fixtures Manufacturing Corporation, Kansas City, Mo.
Continuation of Ser. No. 196,529, Nov. 14, 1980,. This application Aug. 17, 1984, Ser. No. 642,137
Term of patent 14 years
U.S. Cl. D6—380

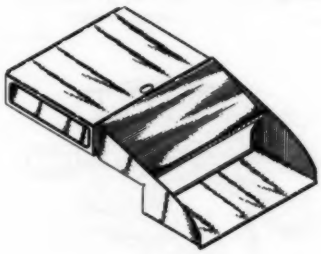
279,439
BED
Giovanni Offredi, Via Ludovico Muratori 29, Milan, Italy
Filed Mar. 10, 1983, Ser. No. 473,874
Claims priority, application Italy, Sep. 17, 1982, 60948B/82
Term of patent 14 years
U.S. Cl. D6—393



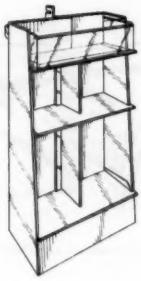
279,440
SUSPENDED FILE HOLDING RACK
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Jan. 3, 1983, Ser. No. 455,017
Term of patent 14 years
U.S. Cl. D6—462



279,441
COMPUTER TERMINAL WORKSTATION
Walter N. Fudala, Cheektowaga, and David O. Hatcher, Eggertsville, both of N.Y., assignors to Posting Equipment Corporation, Buffalo, N.Y.
Filed Feb. 16, 1983, Ser. No. 467,453
Term of patent 14 years
U.S. Cl. D6—474



279,442
COLLAPSIBLE DISPLAY UNIT
William Silver, New York, N.Y., assignor to Thomson-Leeds Company, Inc., New York, N.Y.
Filed Aug. 30, 1982, Ser. No. 412,567
Term of patent 14 years
U.S. Cl. D6—478



279,443
COMBINED SEAT AND BACK SUPPORT UNIT
Niels Diffrient, New York, N.Y., assignor to Knoll International, Inc., New York, N.Y.
Division of Ser. No. 85,852, Oct. 18, 1979, , which is a continuation-in-part of Ser. No. 47,121, Jun. 11, 1979, , which is a continuation-in-part of Ser. No. 904,327, May 3, 1978,. This application Mar. 2, 1984, Ser. No. 585,892
Term of patent 14 years
U.S. Cl. D6—501

279,444
COMBINED TOP AND SUPPORT UNIT FOR A TABLE
John E. McDonald, 1548 Oak Grove Dr., Los Angeles, Calif. 90041
Filed Jun. 13, 1983, Ser. No. 503,761
Term of patent 14 years
U.S. Cl. D6—511

279,445
BOWL
Vivienne D. Jagger, Perth, Australia, assignor to Little People Limited, London, England
Filed Dec. 28, 1982, Ser. No. 453,924
Claims priority, application United Kingdom, Jul. 8, 1982, 1007609
Term of patent 14 years
U.S. Cl. D7—22

279,446
DECALCOMANIA FOR CHINAWARE OR SIMILAR ARTICLES
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed May 17, 1982, Ser. No. 379,173
Term of patent 14 years
U.S. Cl. D7—39

279,447

FILLET KNIFE

Ronald J. Gangelhoff, Mound, Minn.; Ray A. Kohler, Bradford, Pa., and Lee Sexton, Silmore, N.Y., assignors to Chicago Cutlery Consumer Products, Inc., Minneapolis, Minn.

Filed Sep. 9, 1982, Ser. No. 416,385

Term of patent 14 years

U.S. Cl. D7—151

279,448

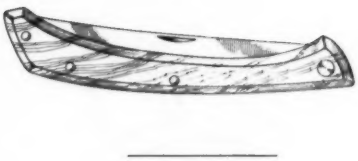
APPARATUS FOR POPPING CORN

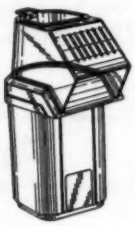
Carl R. Spoeth, Jr., Kewaskum, Wis., assignor to Dart Industries Inc., Northbrook, Ill.

Filed Jan. 14, 1983, Ser. No. 458,088

Term of patent 14 years

U.S. Cl. D7—325





279,449

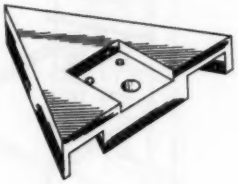
CONNECTOR FOR SIGN PANELS

Paul Alton Finger, Jr., 724 N. Church St. P.O. Box 1662, Salisbury, N.C. 28144

Filed Jan. 23, 1981, Ser. No. 227,699

Term of patent 14 years

U.S. Cl. D8—354



279,450

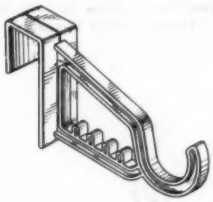
HANGER BRACKET AND HOOK THEREFOR

John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.

Filed Dec. 4, 1981, Ser. No. 327,354

Term of patent 14 years

U.S. Cl. D8—363



279,451

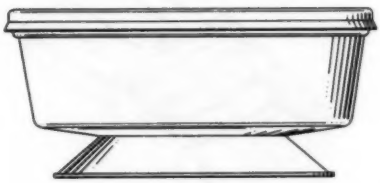
PACKAGING CUP WITH A PEDESTAL BASE

Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.

Filed Oct. 15, 1982, Ser. No. 434,697

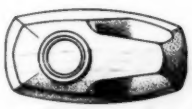
Term of patent 14 years

U.S. Cl. D9—352



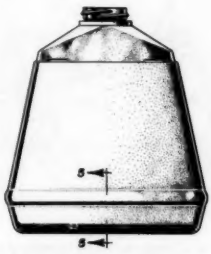
279,452
BOTTLE
Timothy J. Beechuk, Batavia, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Feb. 25, 1983, Ser. No. 470,686
Term of patent 14 years
U.S. Cl. D9—355

279,453
BOTTLE
Timothy J. Beechuk, Batavia, and Edwin F. Neu, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 11, 1983, Ser. No. 483,996
Term of patent 14 years
U.S. Cl. D9—376



279,454
COMBINED BOTTLE AND CAP
Gregory J. Fleming, Livermore, Calif., assignor to The Clorox Company, Oakland, Calif.
Filed Jan. 3, 1983, Ser. No. 455,349
Term of patent 14 years
U.S. Cl. D9—377

279,455
BOTTLE
Gregory J. Fleming, Livermore, Calif., assignor to The Clorox Company, Oakland, Calif.
Filed Jan. 3, 1983, Ser. No. 455,350
Term of patent 14 years
U.S. Cl. D9—389



279,456
JAR OR THE LIKE
Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Division of Ser. No. 390,020, Jun. 21, 1982,. This application May 23, 1984, Ser. No. 651,327
Term of patent 14 years
U.S. Cl. D9—389

279,457
CLOCK
Charles F. Murphy, 3384 S. Robertson Blvd., Los Angeles, Calif. 90027
Filed May 27, 1983, Ser. No. 498,894
Term of patent 14 years
U.S. Cl. D10—22

279,458
CLOCK
Charles F. Murphy, 3384 S. Robertson, Los Angeles, Calif. 90034
Filed May 27, 1983, Ser. No. 498,893
Term of patent 14 years
U.S. Cl. D10—25

279,459
COMBINED WATCH, MEASURING TAPE, AND KEY CHAIN
Marguerite On, Fl. 12, No. 312, Chun Shiao E. Rd., Sec. 4, Taipei, Taiwan
Filed Jan. 6, 1983, Ser. No. 456,118
Term of patent 14 years
U.S. Cl. D10—31

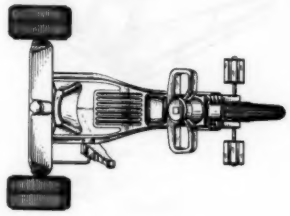
279,460
PARKING BARRIER
Terry L. Souza, 1283 Terryglen La., San Dimas, Calif. 92773
Filed Nov. 12, 1982, Ser. No. 441,279
Term of patent 14 years
U.S. Cl. D10—109

279,461
WHISTLE
Jerome F. Lafreniere, 1715 NE. 96th, Seattle, Wash. 98115, and Steven L. King, 11334 Corliss N., Seattle, Wash. 98133
Filed Jul. 8, 1983, Ser. No. 512,290
Term of patent 14 years
U.S. Cl. D10—119

279,462
FINGER RING
Gary M. Weikel, 3537 S. Buena Vista Dr., Las Vegas, Nev. 89121
Filed Jan. 10, 1983, Ser. No. 456,970
Term of patent 14 years
U.S. Cl. D11—38

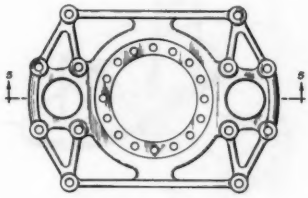
279,463
JEWELRY EMBELLISHMENT
Josef J. Barr, Palm Beach, Fla., assignor to Jewelmasters, Inc., Palm Beach, Fla.
Filed Sep. 12, 1984, Ser. No. 649,744
Term of patent 14 years
U.S. Cl. D11—86

279,464
TRICYCLE
Earl Kane, Norwalk, Conn., assignor to Herman & Rosner Enterprises, Inc., New York, N.Y.
Filed Dec. 22, 1982, Ser. No. 452,184
Term of patent 14 years
U.S. Cl. D12—112



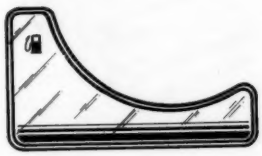
279,465
VEHICLE TIRE
Hideaki Nishio, Saitama; Hiroshi Kojima, and Akira Kurima, both of Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed May 9, 1983, Ser. No. 492,762
Claims priority, application Japan, Nov. 25, 1982, 57-52800
Term of patent 14 years
U.S. Cl. D12—147

279,466
BRAKE HOUSING
Charles E. Eberhart; Karl P. Ettli, both of Arlington; Brenton G. Lake, Dallas, and Jack D. Rainbolt, Arlington, all of Tex., assignors to NuDisc, Inc., Grand Prairie, Tex.
Filed Jun. 15, 1982, Ser. No. 388,602
Term of patent 14 years
U.S. Cl. D12—180

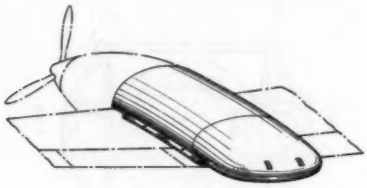


279,467
BRAKE LINING CARRIER
Charles E. Eberhart; Karl P. Ettli, and Jack D. Rainbolt, all of Arlington, Tex., assignors to NuDisc, Inc., Grand Prairie, Tex.
Filed Jun. 15, 1982, Ser. No. 388,603
Term of patent 14 years
U.S. Cl. D12—180

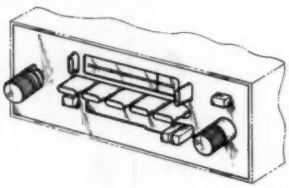
279,468
AUTOMOBILE FUEL DOOR SCRATCH GUARD
Robert F. Marrinan, Worthington, and James D. Orr, Groveport, both of Ohio, assignors to The D. L. Auld Company, Columbus, Ohio
Filed Feb. 18, 1983, Ser. No. 467,993
Term of patent 14 years
U.S. Cl. D12—190



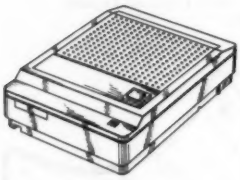
279,469
CARGO CARRIER FOR ATTACHMENT TO THE WING OF AIRCRAFT
James D. Raisbeck, 7536 Seward Park Ave. South, Seattle, Wash. 98118
Filed Sep. 29, 1983, Ser. No. 536,988
Term of patent 14 years
U.S. Cl. D12—345



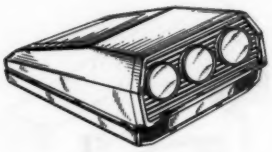
279,470
FRONT PANEL FOR A MOTOR VEHICULAR COMBINED RADIO AND CASSETTE PLAYER, OR THE LIKE
Ronald Dickie, and Carlos A. Altgelt, both of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Sep. 20, 1984, Ser. No. 652,682
Term of patent 14 years
U.S. Cl. D14—10



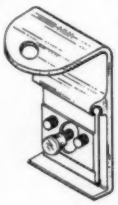
279,471
ELECTRONIC INTERCOMMUNICATION UNIT
Suemitsu Nakashima, Kawasaki, Japan, assignor to Nippon Tsushin Kogyo Kabushiki Kaisha, Kanagawa, Japan
Filed Apr. 29, 1983, Ser. No. 490,134
Claims priority, application Japan, Feb. 9, 1983, 58-4676
Term of patent 14 years
U.S. Cl. D14—58



279,472
TELEVISION PROJECTOR
Yoshiaki Kumagai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Feb. 7, 1983, Ser. No. 464,711
Claims priority, application Japan, Oct. 27, 1982, 57-48697
Term of patent 14 years
U.S. Cl. D14—77



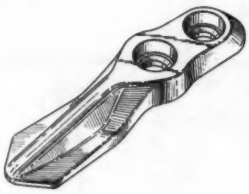
279,473
ANTENNA MOUNT
Samuel A. Hochstetler, P.O. Box #97, and Thomas R. Turner, P.O. Box #158, Joy St., both of Topeka, Ind. 46571
Filed Feb. 16, 1983, Ser. No. 467,154
Term of patent 14 years
U.S. Cl. D14—91



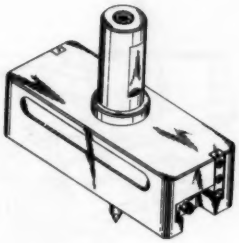
279,474
KEYBOARD
Kenichi Akagi, Littleton; Charles N. Abernethy, Framingham; John C. Costello, Newton Center; Christian C. Landry, Acton; Richard E. Leitermann, Brighton, and David S. Urbanus, South Easton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Aug. 9, 1982, Ser. No. 406,409
Term of patent 14 years
U.S. Cl. D14—100

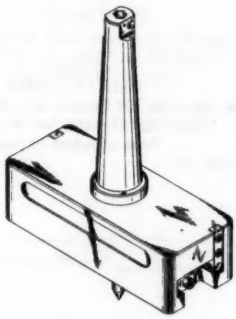
279,475
PERSONAL COMPUTER
Ted Papajohn, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.
Filed Oct. 28, 1982, Ser. No. 437,359
Term of patent 14 years
U.S. Cl. D14—106

279,476
TOOTH FOR BUCKETS ON DIGGING AND LOADING MACHINES
Olay Nja, Kvernaland, Norway, assignor to Kverneland A/S, Kvernaland, Norway
Filed Oct. 17, 1983, Ser. No. 542,407
Claims priority, application Norway, Apr. 29, 1983, 63992
Term of patent 14 years
U.S. Cl. D15—29

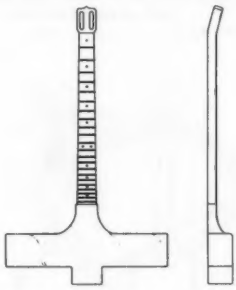


279,477
ADJUSTABLE HOLE CUTTER FOR USE WITH INTERCHANGEABLE ARBORS
Myron B. Mittleman, 35 Sutton Pl., New York, N.Y. 10022
Filed Oct. 19, 1981, Ser. No. 312,751
Term of patent 14 years
U.S. Cl. D15—139

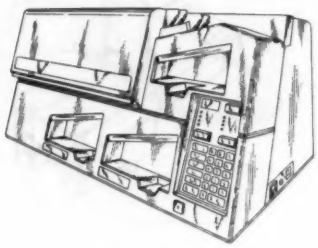




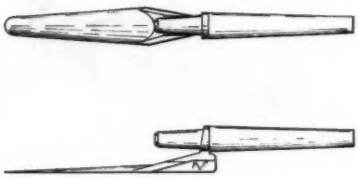
279,478
GUITAR
John P. Sargent, 3509 Robinson Ave., Austin, Tex. 78722
Filed Feb. 11, 1983, Ser. No. 465,898
Term of patent 14 years
U.S. Cl. D17—18



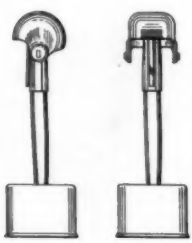
279,479
BANKNOTE SORTER
Graham H. Hilton, Lovedean, England, assignor to De La Rue Systems Limited, Portsmouth, England
Filed Dec. 30, 1982, Ser. No. 454,544
Claims priority, application United Kingdom, Jul. 9, 1982, 1007632
Term of patent 14 years
U.S. Cl. D18—3



279,480
PALETTE KNIFE
Chester W. Kowalski, 639 Parsons Ave., Des Plaines, Ill. 60016
Filed May 23, 1983, Ser. No. 497,260
Term of patent 14 years
U.S. Cl. D19—35

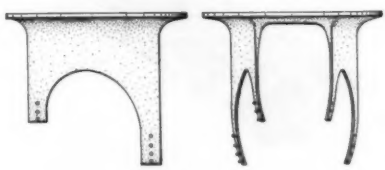


279,481
COMBINED PEN AND HOLDER THEREFOR
Robert Adell, Novi, Mich., assignor to U.S. Product Development Company, Sunnyvale, Tex.
Filed May 14, 1982, Ser. No. 378,311
Term of patent 14 years
U.S. Cl. D19—42

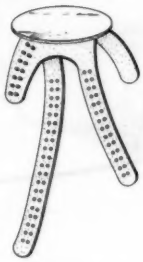


279,482
COPYHOLDER
Albert G. Ermanski, Auburn, Mass., assignor to Wright Line Inc., Worcester, Mass.
Filed Jun. 20, 1983, Ser. No. 505,612
Term of patent 14 years
U.S. Cl. D19—91

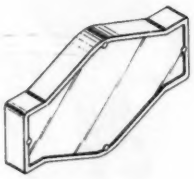
279,483
FUEL NOZZLE AD DISPLAY BOARD
Frank Goldman, Johnstown, Pa., assignor to Noz-L-Ad, Inc., Philadelphia, Pa.
Filed Feb. 7, 1983, Ser. No. 464,265
Term of patent 14 years
U.S. Cl. D20—10



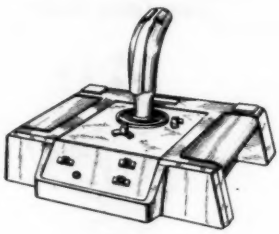
279,484
FUEL NOZZLE AD DISPLAY BOARD
Frank Goldman, Johnstown, Pa., assignor to Noz-L-Ad, Inc., Philadelphia, Pa.
Continuation-in-part of Ser. No. 464,265, Feb. 7, 1983,. This application Oct. 7, 1983, Ser. No. 539,888
Term of patent 14 years
U.S. Cl. D20—10



279,485
ILLUMINATED SIGN
Steven R. Brennan, 2212 W. 53rd St., Minneapolis, Minn. 55419
Filed Oct. 3, 1983, Ser. No. 538,586
Term of patent 14 years
U.S. Cl. D20—17

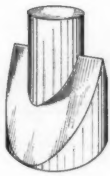


279,486
CONTROLLER FOR A VIDEO GAME OR THE LIKE
Brian J. Maloney, St. Charles, Ill., assignor to International Jensen Incorporated, Schiller Park, Ill.
Filed Apr. 25, 1983, Ser. No. 488,137
Term of patent 14 years
U.S. Cl. D21—48

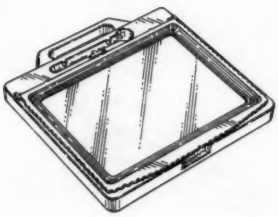


279,487
CHESS PIECE
James Danner, 4241 N. Winchester Ave., Chicago, Ill. 60613
Filed Nov. 8, 1982, Ser. No. 439,842
Term of patent 14 years
U.S. Cl. D21—52

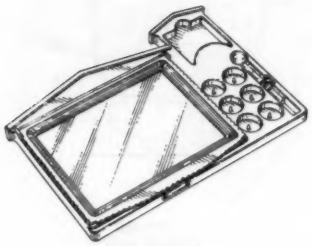
279,488
CHESS PIECE
James Danner, 4241 N. Winchester Ave., Chicago, Ill. 60613
Filed Nov. 10, 1982, Ser. No. 440,512
Term of patent 14 years
U.S. Cl. D21—52



279,489
DRAWING TOY
Kai S. Mak, New Territories, Hong Kong, assignor to Hop Lee Cheong Industrial Co. Ltd., Hong Kong
Filed Mar. 16, 1983, Ser. No. 475,978
Claims priority, application United Kingdom, Sep. 27, 1982, 1008889
Term of patent 14 years
U.S. Cl. D21—59

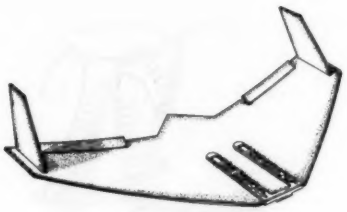


279,490
DRAWING TOY
Kai S. Mak, New Territories, Hong Kong, assignor to Hop Lee Cheong Industrial Co. Ltd., Hong Kong
Filed Mar. 16, 1983, Ser. No. 475,979
Claims priority, application United Kingdom, Sep. 27, 1982, 1008888
Term of patent 14 years
U.S. Cl. D21—59

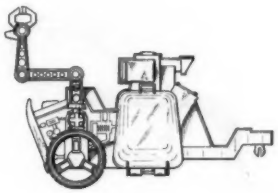


279,491
HANGING TOY ELEPHANT
Robert A. Tell, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 21, 1983, Ser. No. 459,711
Term of patent 14 years
U.S. Cl. D21—63

279,492
TOY GLIDER
Fred D. Eddins, Mapleville, R.I., and Francis V. Perry, Jr., Foxboro, Mass., assignors to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Mar. 21, 1983, Ser. No. 477,418
Term of patent 14 years
U.S. Cl. D21—89

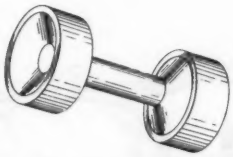


279,493
TOY TRAILER
Karl D. Lerch, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 21, 1983, Ser. No. 459,885
Term of patent 14 years
U.S. Cl. D21—134



279,494
TOY HIPPOPOTAMUS FIGURE
Jacob Nielsen, Copenhagen, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 10, 1982, Ser. No. 448,758
Term of patent 14 years
U.S. Cl. D21—157

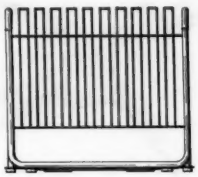
279,495
DUMBBELL
Raymond Barbeau, 102 Morrison, Ville Mont Royal, Quebec, Canada (H3R 1K4)
Filed Apr. 11, 1983, Ser. No. 483,878
Term of patent 14 years
U.S. Cl. D21—197



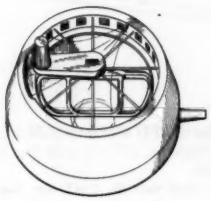
279,496
TENNIS RACQUET
Carlo Gibello, Corso Vittorio Emanuele II, 5, Torino, Italy
Filed Mar. 1, 1983, Ser. No. 471,086
Claims priority, application Italy, Sep. 1, 1982, 53642/82[U]
Term of patent 14 years
U.S. Cl. D21—212

279,497
PUTTER HEAD
Philip J. Brown, 1795 Riverside Rd., Roswell, Ga. 30076
Filed May 31, 1983, Ser. No. 499,302
Term of patent 14 years
U.S. Cl. D21—219

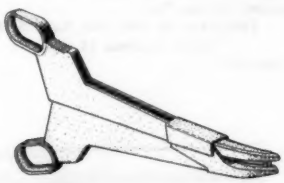
279,498
SAFETY GUARD FOR A HEATER
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Nov. 8, 1983, Ser. No. 549,711
Claims priority, application Japan, May 26, 1983, 22332/1983
Term of patent 14 years
U.S. Cl. D23—137



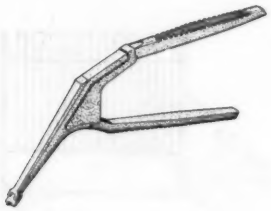
279,499
MIXING APPARATUS
Kirt L. Case, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.
Filed Feb. 18, 1983, Ser. No. 467,704
Term of patent 14 years
U.S. Cl. D24—22



279,500
SURGICAL LIGATING INSTRUMENT
Lawrence E. Spreckelmeier, Cincinnati, Ohio, assignor to Senmed, Inc., Cincinnati, Ohio
Filed Dec. 14, 1982, Ser. No. 449,595
Term of patent 14 years
U.S. Cl. D24—26



279,501
SURGICAL STAPLING INSTRUMENT
Lawrence E. Spreckelmeier, and William K. Burtoft, both of Cincinnati, Ohio, assignors to Senmed, Inc., Cincinnati, Ohio
Filed Dec. 14, 1982, Ser. No. 449,596
Term of patent 14 years
U.S. Cl. D24—26

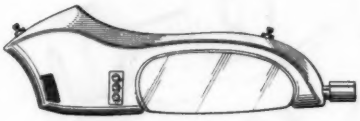


279,502
INTRAMEDULLARY ROD HAVING A S-SHAPED CROSS SECTION
William X. Halloran, 275 Victoria St., Suite 2L, Costa Mesa, Calif. 92627
Filed Nov. 26, 1982, Ser. No. 444,668
Term of patent 14 years
U.S. Cl. D24—33

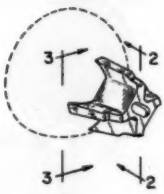
279,503
GROOVED INTRAMEDULLARY ROD
William X. Halloran, 275 Victoria St., Suite 2L, Costa Mesa, Calif. 92627
Filed Nov. 26, 1982, Ser. No. 444,790
Term of patent 14 years
U.S. Cl. D24—33

279,504
VAGINAL APPLICATOR
Dirk Tump, Lebanon, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.
Filed May 15, 1981, Ser. No. 305,416
Term of patent 14 years
U.S. Cl. D24—63

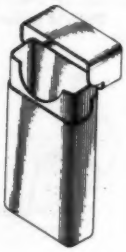
279,505
FIBER OPTIC LIGHT PATTERN GENERATOR
George O. Stadnik, Worcester, Mass., assignor to Interactive Entertainment Corp., Worcester, Mass.
Filed Mar. 15, 1982, Ser. No. 358,476
Term of patent 14 years
U.S. Cl. D26—27



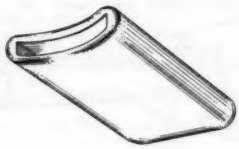
279,506
REFLECTOR LAMP BASE
Bruce R. Simson, Montour Falls, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Dec. 13, 1982, Ser. No. 449,544
Term of patent 14 years
U.S. Cl. D26—113



279,507
CIGARETTE PACKAGE
Alvin H. Schechter, New York, N.Y., and John Svezia, Millburn, N.J., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Aug. 25, 1983, Ser. No. 526,198
Term of patent 14 years
U.S. Cl. D27—47

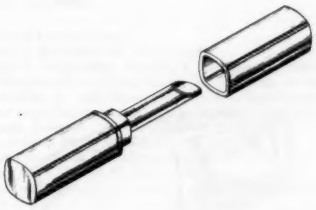


279,508
CIGARETTE PAPER DISPENSER
James E. Bauer, and Luther L. Shaak, both of State College, Pa., assignors to Quickdraw Accessories, Inc., State College, Pa.
Filed May 20, 1981, Ser. No. 265,507
Term of patent 14 years
U.S. Cl. D27—51



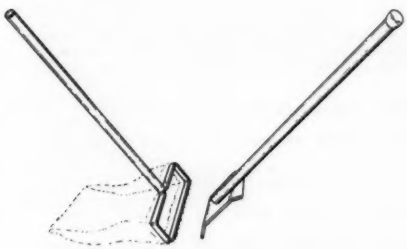
279,509
ELECTRIC SHAVER
Noboru Abe, Suita, Japan, and Florian Seiffert, Grünwald, Fed. Rep. of Germany, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Aug. 12, 1983, Ser. No. 522,798
Claims priority, application Japan, Mar. 2, 1983, 58-8744
Term of patent 14 years
U.S. Cl. D28—49

279,510
LIPSTICK HOLDER
Raymond G. Kairawicz, Watertown, Conn., assignor to Ed-Lin Stamping Company, Inc., Watertown, Conn.
Filed Jul. 29, 1982, Ser. No. 403,126
Term of patent 14 years
U.S. Cl. D28—85

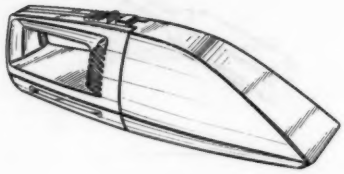


279,511
COSMETIC ATOMIZER
Masaki Matsubara, Narashino, and Shuichi Ikeda, Tokyo, both of Japan, assignors to Shiseido Company Ltd., Tokyo, Japan
Filed May 17, 1982, Ser. No. 378,550
Term of patent 14 years
U.S. Cl. D28—91.1

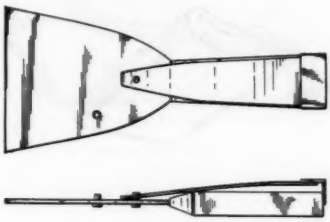
279,512
ANIMAL DROPPING CLEAN-UP SCOOP FOR USE WITH A DISPOSABLE PLASTIC BAG
Henry Schaffer, 983 Major Ave., Hayward, Calif. 94542
Filed Oct. 21, 1983, Ser. No. 544,282
Term of patent 14 years
U.S. Cl. D30—99



279,513
VACUUM CLEANER
Joseph A. Rinaldi, Oradell, N.J.; Paul K. Meeker, Kent, and Werner W. Kochte, Ravenna, both of Ohio, assignors to The Scott & Fetzer Company, Twinsburg, Ohio
Filed Aug. 22, 1983, Ser. No. 525,445
Term of patent 14 years
U.S. Cl. D32—18



279,514
COMBINED SCRAPER, REFINISHING TOOL, WALL PAPER TOOL AND CHISEL
James H. Grunz, 5080 Woodson Dr., Mission, Kans. 66202
Filed Jul. 2, 1982, Ser. No. 394,825
Term of patent 14 years
U.S. Cl. D32—49



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF JULY, 1985

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Hannerz, Kare, 4,526,742, Cl. 376-282.000.
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Abex Corporation: *See—*
Alt, Mark R.; and Olds, John R., 4,525,994, Cl. 59-85.000.

Ables, Charles A. Electric bow for the electric bass guitar. 4,526,082, Cl. 84-325.000.

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Acco Industries Inc.: *See—*
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Johansson, Bengt A.; and Brodin, Peter, 4,526,654, Cl. 162-259.000.

Acharya, Arun; and BeVier, William E., to Union Carbide Corporation. Attrition resistant molecular sieve. 4,526,877, Cl. 502-60.000.

Aciers et Outillage Peugeot: *See—*
Briche, Paul, 4,526,156, Cl. 123-552.000.

Acker, Louis S. Multicolor light pattern image forming system. 4,527,186, Cl. 358-1.000.

Adachi, Masahiro: *See—*
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,526,894, Cl. 514-312.000.

Adams, Richard W. Adjustable auxiliary rear-view mirror. 4,526,446, Cl. 350-624.000.

Adams, Victor J.; and Polka, Frank, to Motorola, Inc. Method of forming a ring of viscous material against a substrate. 4,526,740, Cl. 264-259.000.

Adger, Brian M.; and Mastrocola, Antonietta R., to Smith Kline & French Laboratories Limited. Synthesis of 2-pyridylalkylamines. 4,526,974, Cl. 546-329.000.

Adsco Manufacturing Corp.: *See—*
Schaefer, David A., 4,526,409, Cl. 285-114.000.

Advanced Micro Devices, Inc.: *See—*
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Advanced Tech Tool, Ltd.: *See—*
Sorace, Joseph; and Wright, George, 4,526,128, Cl. 118-314.000.

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AGA Aktiebolag: *See—*
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Agrob Anlagenbau GmbH: *See—*
Rumbach, Karl F., 4,526,537, Cl. 432-239.000.

Ai, Daniel K.; and Yu, Ho, to Aluminum Company of America. Roll caster apparatus having converging tip assembly. 4,526,223, Cl. 164-428.000.

Aigo, Seiichiro. Spin drier for semiconductor material. 4,525,938, Cl. 34-58.000.

Ainpour, Parviz R., to Pfizer Inc. Method for graft copolymerization to natural rubber articles. 4,526,579, Cl. 604-265.000.

Air Products and Chemicals, Inc.: *See—*
Cassano, Anthony A., 4,526,775, Cl. 423-579.000.
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Aisin-Warner Kabushiki Kaisha: *See—*
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Sakakibara, Shiro; and Kawamoto, Mutsumi, 4,526,062, Cl. 74-689.000.

Aizawa, Masanori: *See—*
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Akiyama, Jun-etsu: *See—*
Taya, Akira; Narita, Kazuo; Akiyama, Jun-etsu; Asada, Masao; and Nira, Hisami, 4,527,087, Cl. 313-487.000.

Alamak SA: *See—*
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Alcan International Limited: *See—*
Field, David J., 4,526,630, Cl. 148-159.000.

Alengoz, Anton S.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; and Shevchenko, Jury A. Starting device for self-contained breathing apparatus. 4,526,758, Cl. 422-122.000.

Alfa-Laval Cheese Systems Limited: *See—*
Finnighan, Francis M., 4,526,271, Cl. 198-648.000.

Alfred University Research Foundation, Inc.: *See—*
Funk, James E., 4,526,584, Cl. 44-51.000.

Algieri, Aldo A.; and Crenshaw, Ronnie R., to Bristol-Myers Company. Chemical compounds. 4,526,973, Cl. 546-235.000.

Allan, David T. Control valve assembly. 4,526,190, Cl. 137-119.000.

Allan, G. Graham, to Melamine Chemicals, Inc. Process for oxygen bleaching paper pulp using melamine as a viscosity stabilizer. 4,526,651, Cl. 162-65.000.

Allen-Bradley Company: *See—*
Galdun, Daniel J.; Struger, Odo J.; Grants, Valdis; and Brown, Ronald A., 4,527,250, Cl. 364-900.000.
Sweeton, David C., 4,527,270, Cl. 371-11.000.

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Elsenbaumer, Ronald L.; Miller, Granville G.; and Toth, James E., 4,526,708, Cl. 252-518.000.
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Alps Electric Co., Ltd.: *See—*
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,527,174, Cl. 346-136.000.
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Ijichi, Sadayoshi; and Yamamoto, Masaki, 4,527,280, Cl. 455-183.000.

Alt, Mark R.; and Olds, John R., to Abex Corporation. Coupling link. 4,525,994, Cl. 59-85.000.

Altnau, Ronald L.: *See—*
Fey, Robert M.; and Altnau, Ronald L., 4,526,020, Cl. 68-3.00R.

Altomare, Robert E.; Beale, Robert J.; Glicksman, Martin; Hegedus, Elizabeth; Schulman, Marvin; and Silverman, Jerry E., to General Foods Corporation. Citrus albedo bulking agent and process therefor. 4,526,794, Cl. 426-258.000.

Aluminum Company of America: *See—*
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Hawkins, Ronald G.; and Hooker, Robert M., 4,527,008, Cl. 174-42.000.
Hawkins, Ronald G., 4,527,009, Cl. 174-42.000.
La Barge, Robert L.; Scherf, Thomas W.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Pohlenz, Elmer E., 4,526,096, Cl. 100-53.000.

Alvarez, Oscar E. Heat sealing machine for bonding battery covers and battery casings together. 4,525,923, Cl. 29-730.000.

ALZA Corporation: *See—*
Wong, Patrick S. L., 4,526,578, Cl. 604-892.000.

AM International, Inc.: *See—*
Evans, Robert H.; Espersen, Charles H.; and Tsai, John W., 4,526,364, Cl. 271-272.000.

Amano, Takehisa, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic rhythm performing apparatus. 4,526,080, Cl. 84-1.030.

Amano, Toshio: *See—*
Kozakai, Daisuke; Amano, Toshio; and Nagai, Kunio, 4,527,204, Cl. 360-33.100.

AMB Systems Corp.: *See—*
Silman, Robert E., 4,526,865, Cl. 435-35.000.

Ambrosius, William H., III; and Chung, Randall. Addressable buffer circuit with address incrementer independently clocked by host computer and external storage device controller. 4,527,233, Cl. 364-200.000.

American Can Company: *See—*
Farrell, Christopher J.; and Williams, Mark A., 4,526,823, Cl. 428-35.000.
McHenry, Robert J.; and Seebohm, Robert, 4,526,821, Cl. 428-35.000.

American Cord & Webbing Co., Inc.: *See—*
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American Cyanamid Company: *See—*
Murdock, Keith C.; and Webb, Richard L., 4,526,788, Cl. 514-374.000.
Murdock, Keith C.; and Durr, Frederick E., 4,526,989, Cl. 549-316.000.

American Home Products Corporation: *See*—
Commons, Thomas J.; and Potoski, John R., 4,526,977, Cl. 548-246.000.
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American Standard Inc.: *See*—
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AMF Incorporated: *See*—
Smither, Miles A., 4,527,261, Cl. 367-76.000.

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Ancher, Jean-Francois R.: *See*—
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Anders, Edward O., to Dailey Petroleum Services Corp. Adjustable length drilling sub. 4,526,241, Cl. 175-76.000.

Anderson, David F., to United States of America, Energy. Imaging alpha particle detector. 4,527,064, Cl. 250-374.000.

Anderson, David M., to Baker Oil Tools, Inc. Insulating tubular conduit. 4,526,408, Cl. 285-47.000.

Andersson, Karl J. L., to KMW Aktiebolag. Control system for a multilayer headbox using an ultrasonic transducer. 4,526,653, Cl. 162-259.000.

Ando, Masanao: *See*—
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Andrieu, Andre; Davot, Jean-Pierre P.; and Thibieroz, Jean-Pierre A. M., to Corning Glass Works. Transparent glass-ceramic of light brown color and method of making. 4,526,872, Cl. 501-4.000.

Angele, Werner, to Pfaff Industriemaschinen GmbH. Method and apparatus for manufacturing pantyhose. 4,526,113, Cl. 112-127.000.

Anno, Masami: *See*—
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Anthony, George M. Heat transfer method and apparatus. 4,526,006, Cl. 60-671.000.

Anthony, Thomas R.; Houston, Douglas E.; and Loughran, James A., to General Electric Company. Drilled, diffused radiation detector. 4,527,183, Cl. 357-30.000.

Antonellis, Stephen M.; and Breunig, Roger D., to United Technologies Corporation. Rotor assembly for a gas turbine engine. 4,526,508, Cl. 415-172.00A.

Aoyagi, Yoshiaki: *See*—
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Aparicio, Luis R. Electromechanical system for generating heat in metallic vessels. 4,527,031, Cl. 219-10.49R.

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Arakawa, Hajime, to Murata Manufacturing Co., Ltd. High voltage variable resistor with improved central slider contact construction. 4,527,147, Cl. 338-162.000.

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Ariizumi, Shoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor integrated circuit device with circuits for protecting an input section against an external surge. 4,527,213, Cl. 361-56.000.

Arikawa, Hiroo, to S.O.C. Corporation. Thermal cut-off device. 4,527,144, Cl. 337-407.000.

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Armco Inc.: *See*—
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Arndt, Frank; Claussen, Uwe; Harnisch, Horst; and Schellhammer, Carl-Wolfgang, to Bayer Aktiengesellschaft. Light-collecting systems and the use of coumarin derivatives as energy converters in them. 4,526,705, Cl. 252-301.320.

Arneson Products, Inc.: *See*—
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Asada, Masao: *See*—
Taya, Akira; Narita, Kazuo; Akiyama, Jun-etsu; Asada, Masao; and Nira, Hisami, 4,527,087, Cl. 313-487.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
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Asaida, Takashi: *See*—
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Asano, Toshio: *See*—
Kawamura, Reiki; Tanaka, Takuo; Asano, Toshio; and Sawada, Yasuhiro, 4,526,420, Cl. 297-218.000.

Ashikawa, Keitaro. Heat-treated tea and method for preparing the same. 4,526,796, Cl. 426-465.000.

Ashland Oil, Inc.: *See*—
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Ashworth, Joseph A.: *See*—
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Aso, Akira, to Molex Incorporated. Electrical connector for flat flexible cable. 4,526,436, Cl. 339-176.0MF.

Aso, Tadashi: *See*—
Nakajima, Jun; Araya, Takeshi; Aso, Tadashi; Kawamata, Kiyoshi; and Sugimoto, Kinji, 4,527,045, Cl. 219-130.310.

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Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,527,174, Cl. 346-136.000.
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,527,176, Cl. 346-141.000.

Asonen, Osmo. Method and arrangement for underwater arc welding. 4,527,046, Cl. 219-137.00R.
Associated Packaging Equipment Corp. Ltd.: *See—*
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Assony, Edward M.: *See—*
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AT&T Bell Laboratories: *See—*
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Boie, Robert A.; and Miller, Gabriel L., 4,526,043, Cl. 73-862.040.
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von Seggern, Heinz, 4,527,218, Cl. 361-233.000.
Zweig, Walter L., 4,527,080, Cl. 307-510.000.
AT&T Technologies, Inc.: *See—*
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Atlantic Richfield Company: *See—*
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Atsugi Motor Parts Co., Ltd.: *See—*
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Attal, Gerard J.: *See—*
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Atwell, William A., to Pillsbury Company, The. Refrigerated dough. 4,526,801, Cl. 426-128.000.
Aucel, Jean-Claude; and Testud, Jean-Louis, to La Telemecanique Electrique. Method for identifying the model of a thermal enclosure and application to regulation of thermal enclosure. 4,527,231, Cl. 364-149.000.
Auchapt, Pierre; and Mathieu, Daniel, to Commissariat a l'Energie Atomique. Device for measuring a pressure difference within a pulsed column. 4,526,035, Cl. 73-439.000.
Auderset, Heinrich: *See—*
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Auerbach, Abraham, to General Electric Company. Method for deposition of elemental metals and metalloids on substrates. 4,526,807, Cl. 427-53.100.
Augat Inc.: *See—*
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Ausiello, Francesco P., to Fiat Auto S.p.A. Modular power plant for the combined production of electrical and thermal energy and installation comprising a plurality of modular power plants. 4,527,071, Cl. 290-4.00R.
Automatic Liquid Packaging, Inc.: *See—*
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Avrameas, Stratis; and Guesdon, Jean-Luc, to Institut Pasteur. Conjugate obtained by coupling a lectin and a specific ligand, containing such a conjugate and its applications in biology. 4,526,871, Cl. 436-504.000.
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Axelson, John A., Jr.; and Wise, Kenneth M., to JBC Systems, Inc. Commodity handling system. 4,527,245, Cl. 364-478.000.
Axia Incorporated: *See—*
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B. F. Goodrich Company, The: *See—*
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Baggio, Jean-Louis; and Saintherant, Patrice, to Compagnie Francaise des Petroles. Process for recovering butane and propane from crude gas. 4,526,596, Cl. 62-40.000.
Bailey, Bernard A. Welder's helmet. 4,525,876, Cl. 2-8.000.
Bain, John W., Jr. Security lock for kayaks and the like. 4,526,125, Cl. 114-347.000.
Baker, Gary C., to Hurt, William B., a part interest. Spot thermal or environmental conditioner. 4,526,227, Cl. 165-124.000.
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Bales, Michael E., to Maytag Company, The. Control panel clock lens arrangement. 4,526,332, Cl. 248-27.100.
Ball Corporation: *See—*
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Ballas, John S.: *See—*
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Baltare, Gunnar, to Eaton Corporation. Drum brake spider assembly with removable anchor pin. 4,526,254, Cl. 188-341.000.
Ban, Thomas E. Golf practice device. 4,526,374, Cl. 273-194.00R.
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Barclay, Donald J.: *See—*
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Bargiel, Douglas A.; Assony, Edward M.; Ha, Truong M.; and Rosseau, Richard B., to FMC Corporation. Maintaining constant pick-up broom pattern. 4,525,888, Cl. 15-83.000.
Barker, Clifford S.: *See—*
Schimmel, William P.; Barker, Clifford S.; and Jones, Dana P., 4,526,747, Cl. 419-8.000.
Barnes, David I.: *See—*
Robinson, Joseph G.; and Barnes, David I., 4,526,767, Cl. 423-329.000.
Barns, Robert L.; and Pearson, Arthur D., to AT&T Bell Laboratories. Optical fiber fabrication process. 4,526,599, Cl. 65-3.120.
Bartels-Keith, James R.; and Puttick, Anthony J., to Polaroid Corporation. Uracil derivatives of thio- and selenourea compounds. 4,526,965, Cl. 544-311.000.
Bartholomew, Donald D., to Proprietary Technology, Inc. Swivelable quick connector assembly. 4,526,411, Cl. 285-305.000.
Bartlett, Robert W.; and Bolles, Thomas R., to Atlantic Richfield Company. Process for the production of alumina. 4,526,763, Cl. 423-112.000.
Base Ten Systems, Inc.: *See—*
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BASF Aktiengesellschaft: *See—*
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Hambrecht, Juergen; Brandstetter, Franz; Ziegler, Walter; Muller, Wolfgang F.; Bronstert, Klaus; and Echte, Adolf, 4,526,927, Cl. 525-68.000.
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Zeitler, Gerhard; Bittner, Gerhard; Faehndrich, Knud; and Rombrecht, Hans M., 4,526,952, Cl. 524-496.000.
Bass, Joseph. Portable auxiliary toilet seat. 4,525,880, Cl. 4-244.000.
Batchelor, Frederick H.; and Brown, David J., to Massey-Ferguson Services N.V. Lockable control lever arrangement. 4,526,055, Cl. 74-471.0XY.
Baumgartner, Hans: *See—*
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Bayer Aktiengesellschaft: *See—*
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Beale, Robert J.: *See—*
Altomare, Robert E.; Beale, Robert J.; Glicksman, Martin; Hegedus, Elizabeth; Schulman, Marvin; and Silverman, Jerry E., 4,526,794, Cl. 426-258.000.
Beall, George H.; Borrelli, Nicholas F.; and Morse, David L., to Corning Glass Works. Transparent, mullite glass-ceramics containing ZnO and method. 4,526,873, Cl. 501-5.000.
Beard, William A., Jr.: *See—*
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Bechtolsheim, Andreas V., to Sun Microsystems, Inc. High-speed memory and memory management system. 4,527,232, Cl. 364-200.000.
Becker, Kunibert; Elsner, Burckhardt; and Kirchbrucher, Rudiger, to Gewerkschaft Eisenhutte Westfalia. Mine roof support assembly. 4,526,495, Cl. 405-299.000.
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Beecham Group p.l.c.: *See—*
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Beemer, Richard B.: *See*—
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Beiersdorf Aktiengesellschaft: *See*—
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Bell Maschinenfabrik Aktiengesellschaft: *See*—
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Bellay, Jeffrey D., to Texas Instruments Incorporated. Emulator device including a semiconductor substrate having the emulated device embodied in the same semiconductor substrate. 4,527,234, Cl. 364-200.000.
Beller, Wilbert E.; and Mateja, Edward J., to Singer Company, The. Digital fluid flow rate sensor. 4,526,041, Cl. 73-861.470.
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Benedek, George B.: *See*—
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Bennett, Ernest W., executor: *See*—
Betts, Max W.; Johnson, Nigel, deceased; Bennett, Ernest W., executor; and Bennett, Joyce H., executor, 4,526,019, Cl. 66-132.00R.
Bennett, Joyce H., executor: *See*—
Betts, Max W.; Johnson, Nigel, deceased; Bennett, Ernest W., executor; and Bennett, Joyce H., executor, 4,526,019, Cl. 66-132.00R.
Benninghoven, Alfred; Kampf, Gunther; and Holm, Reimer, to Bayer Aktiengesellschaft. Laser activated mass spectrometer for the selective analysis of individual trace-like components in gases and liquids. 4,527,059, Cl. 250-288.000.
Bennington, Lester D.; and McAfee, Richard C., to SWS Silicones Corporation. Radiation polymerizable compositions containing organopolysiloxanes having a —N—Si— or —N—O—Si— linkage. 4,526,955, Cl. 528-33.000.
Berger, Richard F.; and Pardes, Greg. Flexible pleated container structure. 4,526,296, Cl. 222-107.000.
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Berkstresser, David E. Recumbent velocipede. 4,526,392, Cl. 280-281.0LP.
Bernard, Gilbert: *See*—
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Bernard, Philippe; and Prudhon, Francois, to Rhone-Poulenc Chimie De Base. Clean combustion process/apparatus. 4,526,529, Cl. 431-9.000.
Bernardi, Luigi. Portable device for infusing insulin on the basis of glycemic measurements. 4,526,569, Cl. 604-4.000.
Bernett, Marianne K.; Weber, David C.; and Ravner, Harold, to United States of America, Navy. Antistatic packaging material and steel substrates packaged therewith. 4,526,832, Cl. 428-336.000.
Bernstein, Victor H., to Tri County Tool Inc., a part interest. Manually operable universal key code cutting device. 4,525,908, Cl. 29-76.00C.
Beshty, Bahjat S.; Hatfield, W. Robert; Lee, Hyo C.; Heck, Ronald M.; and Hsiung, Thomas H., to Engelhard Corporation. Method for recovering platinum in a nitric acid plant. 4,526,614, Cl. 75-83.000.
Bestobell (U.K.) Limited: *See*—
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Betensky, Ellis I.; and Welham, Brian H., to U.S. Precision Lens, Inc. Compact projection lens. 4,526,442, Cl. 350-412.000.
Betts, Max W.; Johnson, Nigel, deceased; by Bennett, Ernest W., executor; and by Bennett, Joyce H., executor, to Courtaulds Plc. Yarn feed mechanism. 4,526,019, Cl. 66-132.00R.
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Bianchi, Guiseppe; and Mussinelli, Gian L., to Oronzio de Nora. Method for electrically connecting non corrodible anodes to the corrodible core of a power supply cable. 4,526,666, Cl. 204-196.000.
Bibow, Lawrence C., to Brunswick Corporation. Exhaust relief system. 4,526,002, Cl. 60-293.000.
Bihl, Claudia J., to Kirby, Theodore A. Universal size arm sling. 4,526,164, Cl. 128-94.000.
Binder, Michael; Walker, Charles W., Jr.; Petersen, Eric R.; Wade, William L., Jr.; and Gilman, Sol, to United States of America, Army. Method of pretreating carbon black powder to improve cathode performance and lithium sulfuryl chloride cell including the pretreated carbon black powder. 4,526,881, Cl. 502-101.000.
Bingler, Douglas J., to Milton Roy Company. Shaft driven pump without seals. 4,526,507, Cl. 415-170.00B.
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Biorcio, Luciano; and Mensi, Carlo, to P. D. George Co., The; and Industrie Vernici Italiane S.p.A. Phenoxy resins and use thereof in electric insulation. 4,526,912, Cl. 523-456.000.
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Bischoff, Hilmar: *See*—
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Bittner, Gerhard: *See*—
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Bittner, Harry J.; Culmer, Daniel D.; and Davis, Walter R., to National Semiconductor Corporation. Bistate linear amplifier circuit. 4,527,128, Cl. 330-9.000.
Black & Decker Inc.: *See*—
Zavis, Wayne; and Saar, David A., 4,527,101, Cl. 318-245.000.
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Tanielian, Minas; Blackstone, Scott; and Lajos, Robert, 4,526,665, Cl. 204-192.00C.
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Blankenship, Ronnie L.: *See*—
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Blechman, Abraham; and Pescatore, Eugene A., to Medical Magnetics, Inc. Palatal retention device. 4,526,539, Cl. 433-18.000.
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Blomquist, Seppo I.; Saarela, Markku T.; Pouru, Hannu J.; Nyman, Bror G.; Lindroos, Kaj-Henrik; Koivunen, Timo T.; and Fugleberg, Sigmund P., to Outokumpu Oy. Method for regenerating pickling acids. 4,526,650, Cl. 156-642.000.
Bloomfield, Allen A.; and Goodall, James R., to Imperial Chemical Industries Limited. Traverse roll for filament yarn cross winding apparatus. 4,526,326, Cl. 242-43.200.
Blume, Cheryl D.; and Bonner, Paul H., to Mylan Pharmaceuticals Inc. Pharmaceutical combination composition and associated method. 4,526,777, Cl. 424-20.000.
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Boersma, Rintje; van Wijnandsbergen, Marius F. F.; Irik, Gijsbert W.; and Marien, Pieter, to Coq B.V. Multiphase switchgear for high voltages. 4,527,220, Cl. 361-332.000.
Bogan, Leonard E.; and Hamersley, Richard A., to International Telephone and Telegraph Corporation. Interface circuit for use in a distributed processing switch unit. 4,527,266, Cl. 370-58.000.
Bogel, Graham D., to Acco Industries Inc. Method and apparatus for control of pipeline compressors. 4,526,513, Cl. 417-5.000.
Boger, David L.; Johnson, Leighton C.; and Pugh, Jerry T., to Miles Laboratories, Inc. Multiple profile reagent card. 4,526,753, Cl. 422-56.000.
Bogucki-Land, Bogdan, to Karl Mayer Textilmaschinenfabrik GmbH. Apparatus for beaming elastic threads. 4,525,905, Cl. 28-185.000.
Bohan, John E., Jr.; Bonne, Ulrich; and Weber, Dane M., to Honeywell Inc. High voltage spark electrode structure. 4,527,085, Cl. 313-128.000.
Bohg, Armin; Hartmann, Kurt; and Matthaei, Horst, to International Business Machines Corporation. Electromagnetic ram actuator. 4,527,139, Cl. 335-256.000.
Bohman, Carl E.: *See*—
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Boie, Robert A.; and Miller, Gabriel L., to AT&T Bell Laboratories. Conformable tactile sensor. 4,526,043, Cl. 73-862.040.
Boland, James F.; and Koenig, John F., to United States of America, Energy. Control system for fluid heated steam generator. 4,526,136, Cl. 122-451.100.
Boll, Rudi; Tetzlaff, Arno; and Steidle, Gerhard. Apparatus for fastening instruments in a front panel or switchboard. 4,526,427, Cl. 312-111.000.
Bolles, Thomas R.: *See*—
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Bonham, Christopher: *See*—
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Bono, Giancarlo: *See*—
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Bonolis, Vincent P. Rail lock. 4,526,499, Cl. 410-31.000.

Boots Company PLC, The: *See*—
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Borg-Warner Corporation: *See*—
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Borne, Andre ; Marmonier, Andre ; and Ruiz, Ariel, to CGEE Alsthom. Cable clamping device. 4,526.435, Cl. 339-103.00C.
Borrelli, Nicholas F.: *See*—
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Borrman, Bo; Leine, Lars; Nylund, Olov; and Ode, Bengt, to AB Asea-Atom. Fuel assembly for a boiling water reactor. 4,526,744, Cl. 376-440.000.
Borucki, John S.: *See*—
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Boskamp, Jelles V.; and Mohlmann, Willem M. M., to Lever Brothers Company. Built liquid detergent compositions containing zeolite Y. 4,526,709, Cl. 252-527.000.
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Bouchard, Andre C.; Maya, Jakob; Loughridge, Fred; Andress, Charles W.; and Wierzbicki, Julian, to GTE Products Corporation. Metal arc director for compact fluorescent lamp. 4,527,088, Cl. 313-493.000.
Bouchard, Andre C.; and Maya, Jakob, to GTE Products Corporation. Compact fluorescent lamp. 4,527,089, Cl. 313-493.000.
Bouffard, Jean: *See*—
Dumoulin, Andre ; Seguin, Marc; and Bouffard, Jean, 4,525,993, Cl. 57-58.520.
Boughton, Edward M.; and Jones, Lewis O., to TRW Inc. Magnetic developer compositions. 4,526,851, Cl. 430-106.600.
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., to Delalande S.A. N-Substituted phenyl-5-aminomethyl oxazolidinones and their method of use. 4,526,786, Cl. 514-240.000.
Boveri, Sergio: *See*—
Nisato, Dino; and Boveri, Sergio, 4,526,995, Cl. 549-494.000.
Bowen, David R.: *See*—
Luccarelli, Domenick, Jr.; Mookherjee, Braja D.; Wilson, Richard A.; Zampino, Michael J.; and Bowen, David R., 4,526,798, Cl. 426-534.000.
Bowers, James H.: *See*—
Marschner, Frank W.; Kenkare, Divaker B.; and Bowers, James H., 4,526,780, Cl. 424-66.000.
Bowman, Albert M.; and Wodtke, Roy W. Basket and tray attachment for wheelchair. 4,526,419, Cl. 297-153.000.
Box, William A.; and Rusiecki, Eugene R., to United States Steel Corporation. Cross-flow ultrasonic transducer head. 4,526,038, Cl. 73-644.000.
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., to Martin Marietta Aluminum Inc. Aluminum cell cathode coating composition. 4,526,911, Cl. 523-445.000.
Boxer, Michael A.; and Posdal, Ben A., to CardioSearch, Inc. Sport hydration system. 4,526,298, Cl. 222-130.000.
Braden, Denver, to Palomar Systems & Machines, Inc. Means for processing miniature electronic components such as capacitors or resistors. 4,526,129, Cl. 118-503.000.
Branche, Bernard: *See*—
Durivault, Jean; and Branche, Bernard, 4,526,336, Cl. 248-349.000.
Brand, Peter J.: *See*—
Lester, Graham G.; Brand, Peter J.; and Deane, Graham, 4,526,573, Cl. 604-33.000.
Brandenstein, Manfred; Walter, Lothar; and Kiener, Heinz, to SKF Kugellagerfabriken GmbH. Hydraulically operable release arrangement. 4,526,259, Cl. 192-91.00A.
Brandin, Christopher L. Digital data storage methods and apparatus. 4,527,239, Cl. 364-300.000.
Brandon, Arthur: *See*—
Goldberg, Marvin; and Brandon, Arthur, 4,526,781, Cl. 424-70.000.
Brandstadter, Manfred: *See*—
Sudbeck, Rainer; Baumgartner, Hans; and Brandstadter, Manfred, 4,526,521, Cl. 418-55.000.
Brandstetter, Franz: *See*—
Hambrecht, Juergen; Brandstetter, Franz; Ziegler, Walter; Muller, Wolfgang F.; Bronstert, Klaus; and Echte, Adolf, 4,526,927, Cl. 525-68.000.
Branham, Tillman W., to Connell, Joseph N. Safety jumper cables. 4,527,111, Cl. 320-26.000.
Brasa, Umberto, to Siasprint S.r.l. Gripper device for transporting and registering plates or sheets to be overprinted on silk screen printing machines in one or more colors. 4,526,100, Cl. 101-408.000.
Brauch, Robert B., to Singer Company, The. Stitch length control dampening arrangement for a sewing machine. 4,526,118, Cl. 112-315.000.
Brauer, Larry F.; and Leach, Roger W., to United States of America, Navy. Safety-arming device. 4,526,104, Cl. 102-228.000.
Braun, Alfred J.; Burdick, Aron; and Scarton, Henry A. Vortex carburetor. 4,526,729, Cl. 261-36.00A.
Bremer, Roger E.; Anthony, Charles, Jr.; and Chappel, Raymond M., to Frantz Medical Development Ltd. Long-life biomedical application device, particularly electrode, and method of transferring electrical current. 4,526,176, Cl. 128-641.000.
Brennan, Edward J.; Long, William A.; and Brunelle, Rene J., to PTC Aerospace Inc. Multi-passenger aircraft seat having composite panel frame. 4,526,421, Cl. 297-232.000.
Breslow, Jeffrey D.: *See*—
Rosenwinkel, Donald A.; Breslow, Jeffrey D.; and Zaruba, John V., 4,526,376, Cl. 273-249.000.
Bresnick, Herbert L., to Xerox Corporation. Multi-roll fusing system. 4,526,459, Cl. 355-3.0FU.
Breunig, Roger D.: *See*—
Antonellis, Stephen M.; and Breunig, Roger D., 4,526,508, Cl. 415-172.00A.
Briand, Jean P. Conical bobbin and method of forming same. 4,526,566, Cl. 493-296.000.
Briche, Paul, to Aciers et Outillage Peugeot. Air intake for an air filter of an internal combustion engine. 4,526,156, Cl. 123-552.000.
Bridgestone Tire Company Limited: *See*—
Maeda, Muneyoshi; Endo, Kazuyuki; and Tansei, Hikaru, 4,526,217, Cl. 152-527.000.
Oshima, Noboru; Shimizu, Isamu; Yoshimura, Yoshito; Fujimaki, Tatsuo; and Tomita, Seisuke, 4,526,934, Cl. 525-332.900.
Bright, Gene M., to Pfizer Inc. Epimeric azahomoerythromycin A derivative, intermediates and method of use. 4,526,889, Cl. 514-29.000.
Bristol-Myers Company: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,526,973, Cl. 546-235.000.
Williams, Patricia D.; and Hottendorf, Girard H., 4,526,888, Cl. 514-12.000.
British Nuclear Fuels Limited: *See*—
Reekie, John, 4,526,045, Cl. 73-864.310.
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., to Hoffmann-La Roche Inc. Anthracycline glycosides. 4,526,960, Cl. 536-6.400.
Brockmann, Sigismund; and Gottschalk, Ingo, to Siemens Aktiengesellschaft. Encapsulated, compressed gas insulated high voltage switchgear. 4,527,029, Cl. 200-148.00B.
Brockway, Inc.: *See*—
Myers, Ronald T., 4,526,600, Cl. 65-24.000.
Brockway, Inc., (NY): *See*—
Misczyk, Gerald P., 4,526,816, Cl. 427-417.000.
Brodin, Peter: *See*—
Johansson, Bengt A.; and Brodin, Peter, 4,526,654, Cl. 162-259.000.
Bronstert, Klaus: *See*—
Hambrecht, Juergen; Brandstetter, Franz; Ziegler, Walter; Muller, Wolfgang F.; Bronstert, Klaus; and Echte, Adolf, 4,526,927, Cl. 525-68.000.
Brophy, H. Joseph, Jr.: *See*—
Brophy, H. Joseph, Sr.; and Brophy, H. Joseph, Jr., 4,525,929, Cl. 30-181.000.
Brophy, H. Joseph, Sr.; and Brophy, H. Joseph, Jr. Cutting device. 4,525,929, Cl. 30-181.000.
Browall, Kenneth W.: *See*—
Iacovangelo, Charles D.; and Browall, Kenneth W., 4,526,812, Cl. 427-115.000.
Brown, David J.: *See*—
Batchelor, Frederick H.; and Brown, David J., 4,526,055, Cl. 74-471.0XY.
Brown, Kenneth H., to Motorola Inc. Frequency acquisition circuit for phase locked loop. 4,527,127, Cl. 329-122.000.
Brown, Richard A., to FMC Corporation. Recovery of vanadium from acidic solutions thereof. 4,526,762, Cl. 423-63.000.
Brown, Ronald A.: *See*—
Galdun, Daniel J.; Struger, Odo J.; Grants, Valdis; and Brown, Ronald A., 4,527,250, Cl. 364-900.000.
Bruel, Michel; Floccari, Michel, deceased (by Floccari, Henriette, administratrix); and Michaud, Jean-Francois, to Commissariat a l'Energie Atomique. Apparatus for treating a sample by a pulsed electron beam. 4,527,044, Cl. 219-121.0EB.
Brunelle, Rene J.: *See*—
Brennan, Edward J.; Long, William A.; and Brunelle, Rene J., 4,526,421, Cl. 297-232.000.
Brunet, Michel, to Sandoz Ltd. Adapter device for spraying the content of a sectile ampule. 4,526,302, Cl. 222-321.000.
Brunswick Corporation: *See*—
Bibow, Lawrence C., 4,526,002, Cl. 60-293.000.
Bryan, Larry E.; Grove, Richard W.; and Primus, William F., to Marathon Oil Company. Method and apparatus for replacing bearings. 4,525,914, Cl. 29-402.080.
Buchta, William M.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,526,911, Cl. 523-445.000.
Budd Company, The: *See*—
Dickhart, William W., III, 4,526,109, Cl. 105-199.00R.
Buehler, Charles K., to Northern Petrochemical Company. Olefin polymerization catalyst activity by simultaneous olefin washing and addition of electron donor. 4,526,883, Cl. 502-108.000.
Buracchi, Livio: *See*—
Giobbio, Vincenzo; Ornato, Giorgio; Buracchi, Livio; and Mangia, Alberto, 4,526,985, Cl. 549-253.000.
Burdick, Aron: *See*—
Braun, Alfred J.; Burdick, Aron; and Scarton, Henry A., 4,526,729, Cl. 261-36.00A.

Burgess, Lester E.; Fox, Karl M.; and McGarry, Phillip E., to Standard Oil Company, The. Beneficiated coal, coal mixtures and processes for the production thereof. 4,526,585, Cl. 44-51.000.

Burguette, Mario D.; and Foss, George D., to Minnesota Mining and Manufacturing Company. Magnetic recording medium having a perfluoropolyether polymer protective coating. 4,526,833, Cl. 428-336.000.

Burkhardt, Horst; and Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Error correction system for position measuring device. 4,527,056, Cl. 250-237.00G.

Burkley, Thomas E.; and Kifor, Harry T., to Goodyear Tire & Rubber Company, The. Inflatable plug for interiorly cylindrical conduits. 4,526,207, Cl. 138-93.000.

Burns, Donald A.; Margoshes, Marvin; and Cassaday, Michael M., to Technicon Instruments Corporation. Sample transport system. 4,526,754, Cl. 422-82.000.

Burns, Jimmy H.: *See—*
Mohon, Windell N.; and Burns, Jimmy H., 4,526,545, Cl. 434-38.000.

Burns, Kenneth R.; and Early, Jack J., to Engelhard Corporation. Method and means for controlling air-to-fuel ratio. 4,526,001, Cl. 60-274.000.

Burridge, Robert E.: *See—*
Mease, Richard B.; and Burridge, Robert E., 4,526,457, Cl. 354-345.000.

Burrington, James D.: *See—*
Tsou, Dean T.; Burrington, James D.; Maher, Elizabeth A.; and Grasselli, Robert K., 4,526,884, Cl. 502-154.000.

Burroughs Corporation: *See—*
Kilborn, Hilary M. H., 4,527,052, Cl. 235-485.000.

Burton, Lester P. J., to Ethyl Corporation. Phenolic phosphite antioxidant and process for preparation thereof. 4,526,918, Cl. 524-150.000.

Bury, James, to L.K. Tool Company Limited. Apparatus for carrying machine elements. 4,525,930, Cl. 33-1.00M.

Busch, Hans-Peter: *See—*
Hirschmann, Adolf M.; Kaser, Klaus; Rieker, Hans; Busch, Hans-Peter; Rathke, Willi; and Maul, Heinz P., 4,526,294, Cl. 222-47.000.

Byerley, John J.; and Enns, Kurt. Processes for the recovery of cyanide from aqueous thiocyanate solutions and detoxication of aqueous thiocyanate solutions. 4,526,662, Cl. 204-86.000.

Bykov, Anatoly P.; Orlov, Anatoly A.; Gribanov, Dmitry D.; Kulesh, Vladimir P.; Fonov, Sergei D.; Egorov, Vitaly V.; Moskalik, Leonid M.; Martynov, Apollinary K.; and Ryadchikov, Vladimir E. Method for sensing spatial coordinate of article point and apparatus therefor. 4,526,471, Cl. 356-373.000.

Byrne, George C., to SRI International. Method and apparatus for intrusion detection. 4,527,151, Cl. 340-554.000.

C. A. Weidmuller GmbH & Co.: *See—*
Undin, Hans; and Wiener, Hans, 4,526,068, Cl. 81-9.400.
Wiener, Hans; and Undin, Hans, 4,526,070, Cl. 81-361.000.

Cabot Corporation: *See—*
Huber, Louis E., Jr.; and Schwartz, Harry D., 4,526,749, Cl. 420-427.000.

Calenda, Ciro: *See—*
De Filippis, Pietro; Salvatore, Amedeo; Calenda, Ciro; and Notaro, Giuseppe, 4,527,142, Cl. 337-105.000.

Calgon Carbon Corporation: *See—*
Sutt, Robert F., Jr., 4,526,887, Cl. 502-420.000.

Calgon Corporation: *See—*
Matz, Gary F., 4,526,957, Cl. 528-366.000.

Calhoun, Gregory L.; and Candee, Clark B., to Westinghouse Electric Corp. Eddy current workpiece positioning apparatus. 4,526,135, Cl. 122-382.000.

California Institute of Technology: *See—*
Stanton, Philip H., 4,527,163, Cl. 343-700.0MS.
Tombrello, Thomas A.; Qiu, Yuanxun; and Mendenhall, Marcus H., 4,526,624, Cl. 148-1.500.

Callahan, Michael. Followspot parameter feedback. 4,527,198, Cl. 358-185.000.

Cammack, Malcolm E. Fence connector. 4,526,348, Cl. 256-65.000.

Campbell, Curtis B., to Chevron Research Company. Deposit control additives-methylol polyether amino ethanes. 4,526,587, Cl. 44-73.000.

Campbell, Gaylon S.; Tanner, Bertrand D.; and Gauthier, Robert V., to Campbell Scientific, Inc. Krypton hygrometer. 4,526,034, Cl. 73-336.500.

Campbell Scientific, Inc.: *See—*
Campbell, Gaylon S.; Tanner, Bertrand D.; and Gauthier, Robert V., 4,526,034, Cl. 73-336.500.

Canadian Patents and Development Limited-Societe Canadien Ne Des Brevets Et D'Exploitation Limitee: *See—*
Strickland, John I., 4,527,162, Cl. 343-351.000.

Candee, Clark B.: *See—*
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Canon Kabushiki Kaisha: *See—*
Fujiyama, Yasutomo; and Kamiya, Osamu, 4,526,644, Cl. 156-345.000.
Kinoshita, Takao; and Hosoe, Kazuya, 4,527,053, Cl. 250-201.000.
Kinoshita, Takao; Tsunekawa, Tokuichi; and Sato, Yuichi, 4,527,199, Cl. 358-213.000.
Suzuki, Ryoichi; and Uchiyama, Takashi, 4,526,454, Cl. 354-227.100.

Caparros, Pierre: *See—*
Mutschler, Ulrich; Caparros, Pierre; Mouterde, Pierre; and Frappe, Pierre, 4,526,210, Cl. 139-59.000.

Capewell, Dennis; Luchaco, David G.; and Spira, Joel S., to Lutron Electronics Co., Inc. Control circuit for gas discharge lamps. 4,527,099, Cl. 315-291.000.

Caplan, Jerome S.; Delmege, James W.; Laman, Robert R.; and Navarro, Christine, to Redcom Laboratories Inc. Communications switching system with modular switching communications peripheral and host computer. 4,527,012, Cl. 179-18.0ES.

Cappels, Richard D., to Panavision, Inc. Zoom indicating apparatus for video camera or the like. 4,527,201, Cl. 358-224.000.

Caravaggi, Anna M.: *See—*
Salvati, Patricia; Caravaggi, Anna M.; Temperilli, Aldemio; Bosisio, Germano; Sapini, Osvaldo; and di Salle, Enrico, 4,526,892, Cl. 514-288.000.

Carden, John C.; Dimitracopoulos, Panayotis C.; and Arnold, George D. M., to Quadrant Drive B.V. Motion transmitting devices. 4,526,064, Cl. 74-804.000.

CardioSearch, Inc.: *See—*
Boxer, Michael A.; and Posdal, Ben A., 4,526,298, Cl. 222-130.000.

Carlo Erba Strumentazione S.p.A.: *See—*
Sisti, Giorgio; Trestiano, Sorin; and Riva, Ermete, 4,526,686, Cl. 210-198.200.

Carlson, David A.; and McLaughlin, John R., to United States of America, Agriculture. Diolefin pheromone mimics as disruptants of sexual communication in insects. 4,527,000, Cl. 585-16.000.

Carlson, Gary M.; and Abbey, Kirk J., to SCM Corporation. Low molecular weight polymers and copolymers. 4,526,945, Cl. 526-145.000.

Carnegie-Mellon University: *See—*
Okada, Tokuji; and Kanade, Takeo, 4,526,106, Cl. 104-138.00G.

Carpano & Pons: *See—*
Saligny, Yves, 4,526,434, Cl. 339-99.00R.

Carroll, Richard A., to Quality Services Incorporated. Paper fastener. 4,525,899, Cl. 24-67.00P.

Carroll, William R. Shielded electrical cable system. 4,527,073, Cl. 307-90.000.

Carson, John C.; and Clark, Stewart A., to Irvine Sensors Corporation. High-density electronic processing package-structure and fabrication. 4,525,921, Cl. 29-577.00C.

Carson, William W., to Millipore Corporation. Stabilized apparatus for converting rotational motion to linear motion. 4,526,053, Cl. 74-424.80C.

Carter, John H., to United Kingdom Atomic Energy Authority. Anti-corrosion treatment process. 4,526,626, Cl. 148-6.14R.

Caruso, Richard. Steamable hair curler. 4,526,184, Cl. 132-39.000.

Cascone, Paul J., to Pennwalt Corporation. Non-staining palladium based dental alloy. 4,526,750, Cl. 420-463.000.

Cassaday, Michael M.: *See—*
Burns, Donald A.; Margoshes, Marvin; and Cassaday, Michael M., 4,526,754, Cl. 422-82.000.

Cassano, Anthony A., to Air Products and Chemicals, Inc. Oxygen production by molten alkali metal salts using multiple absorption-desorption cycles. 4,526,775, Cl. 423-579.000.

Cassidy, Benjamin J., to International Paper Company. Fliptop carton. 4,526,317, Cl. 229-44.0CB.

Castner, Kenneth F., to Goodyear Tire & Rubber Company, The. N,N-Dimethylacrylamide copolymer injection water viscosifier for enhanced oil recovery. 4,526,947, Cl. 526-240.000.

Castrol Limited: *See—*
Cox, Paul V., 4,526,697, Cl. 252-75.000.

Catchpole, Brian G., to Commonwealth of Australia, The. Drive arrangement for internal combustion engine. 4,526,141, Cl. 123-51.0BA.

Cater, Janet E.: *See—*
Ziebarth, Warren S.; and Cater, Janet E., 4,525,959, Cl. 51-391.000.

Caughey, Robert A., to permaTek, Inc. Flyleaf heat sealer. 4,526,642, Cl. 156-311.000.

Cawley, William E.; and Trapp, Turner J., to United States of America, Energy. Fuel assembly for the production of tritium in light water reactors. 4,526,741, Cl. 376-185.000.

Cazinha, John R.: *See—*
Sears, Billy D.; Holland, Gerald G.; Cazinha, John R.; and Reames, Donovan J., 4,525,956, Cl. 51-241.00S.

Ceccon, Harry; Murphy, Richard A.; Reed, H. David; and Orringer, Oscar, to United States of America, Transportation. Removable strain gauge fixture and method for measuring accumulated strain in a material. 4,526,039, Cl. 73-774.000.

Cecil, Richard L., to Easco Corporation. Adapter for wrench sockets. 4,526,069, Cl. 81-177.850.

Cederholm, Allen E.: *See—*
Schmidt, Henry, Jr.; Cederholm, Allen E.; and Zievers, James F., 4,526,688, Cl. 210-323.200.

Celanese Corporation: *See—*
Hall, Henry K.; and Wilson, Donald R., 4,526,949, Cl. 526-268.000.

Century Laboratories, Inc.: *See—*
Rubin, David, 4,526,902, Cl. 514-560.000.

Cercone, Richard S. Ring and singing device with push tab. 4,526,016, Cl. 63-15.600.

Cerny, Daryl D., to Ball Corporation. Flanged container. 4,526,290, Cl. 220-415.000.

Cerveny, Leonard W.; Bonham, Christopher; Mull, J. C., Jr.; and Shellman, Jon V., to Pacific Wire Works, Inc. Collapsible basket. 4,526,285, Cl. 220-7.000.

Cestaro, Massimo; and De Lena, Oscar, to Societa Italiana Vetro-SIV-S.p.A. Multiband aerial, especially suitable for a motor vehicle window. 4,527,164, Cl. 343-713.000.

CGEE Alsthom: *See*—
Borne, Andre ; Marmonier, Andre ; and Ruiz, Ariel, 4,526,435, Cl. 339-103.00C.

Cha, Dae Y.: *See*—
Van Rheenen, Verlan H.; and Cha, Dae Y., 4,526,720, Cl. 260-397.400.

Chadabe, Joel, to Chadabe, Joel. Interactive music composition and performance system. 4,526,078, Cl. 84-1.030.

Chambers, Colin T.; and Rhodes, James V. Security listening system. 4,527,015, Cl. 179-84.00R.

Champion International Corporation: *See*—
Koll, Eugene A., 4,526,527, Cl. 425-90.000.

Champion Spark Plug Company: *See*—
Hoffmanner, Albert L.; Semiatin, Sheldon L.; and Podiak, Richard S., 4,526,551, Cl. 445-7.000.

Chan, Rebecca L. S.: *See*—
Dawson, Marcia I.; Chan, Rebecca L. S.; and Hobbs, Peter D., 4,526,787, Cl. 514-255.000.

Chang, Marguarite S.; and Orndoff, Robert R., to United States of America, Navy. Method for the preparation of tetranitrodibenzotetrazapentalene. 4,526,980, Cl. 548-258.000.

Chaplin, George B. B.; Jones, Andrew; and Jones, Owen, to Sound Attenuators Limited. Method and apparatus for low frequency active attenuation. 4,527,282, Cl. 381-71.000.

Chappel, Raymond M.: *See*—
Bremer, Roger E.; Anthony, Charles, Jr.; and Chappel, Raymond M., 4,526,176, Cl. 128-641.000.

Chas. M. Bailey Co., Inc.: *See*—
Dixon, Robert W., 4,526,192, Cl. 137-244.000.

Chase, J. Burrell. Roller skate brake. 4,526,389, Cl. 280-11.210.

Chauveau, Jean-Marie, to Hasler Freres International S.A. Method for continuous weighing of divided products and apparatus for putting method to use. 4,526,244, Cl. 177-1.000.

Chebra, Ronald J., to Base Ten Systems, Inc. Subscriber terminal polling unit. 4,527,235, Cl. 364-200.000.

Chemische Werke Huls Aktiengesellschaft: *See*—
Disteldorf, Josef; zur Hausen, Manfred; Hubel, Werner; and Kriebel, Gunter, 4,526,971, Cl. 546-186.000.

Chen, Timothy S.: *See*—
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-Ta S.; and Chen, Timothy S., 4,526,925, Cl. 524-548.000.

Chester, Arthur W.; and Murray, James G., to Mobil Oil Corporation. Catalyst for olefin polymerization. 4,526,942, Cl. 526-130.000.

Cheung, William S. H., to Payview Limited. Apparatus for encoding and decoding information. 4,527,195, Cl. 358-120.000.

Chevron Research Company: *See*—
Campbell, Curtis B., 4,526,587, Cl. 44-73.000.
Sweeney, William A., 4,527,004, Cl. 585-851.000.

Chi Yu, Simon S. Wide band full duty cycle isolated transformer driver. 4,527,228, Cl. 363-98.000.

Chiba, Hiromasa; Harada, Takakiyo; Kumahara, Katsumi; Kawazoe, Shunji; and Sato, Akihiro, to Chisso Corporation. Whitening-resistant, highly melt-viscoelastic ethylene-propylene copolymer and process for producing the same. 4,526,931, Cl. 525-268.000.

Chiba, Seiichi: *See*—
Suzuki, Yasunobu; Chiba, Seiichi; and Nishimura, Akihiro, 4,526,646, Cl. 156-361.000.

Chibata, Ichiro; Tosa, Tetsuya; and Takamatsu, Satoru, to Tanabe Seiyaku Co., Ltd. Process for preparing immobilized microorganism. 4,526,867, Cl. 435-178.000.

Chicago Metallic Corporation: *See*—
Vukmanic, Ronald W.; Borucki, John S.; and Stanley, Chester A., 4,525,973, Cl. 52-667.000.

Chicago Rawhide Mfg. Co.: *See*—
Riley, William M., Jr; and Vassmer, Gregory R., 4,526,384, Cl. 277-153.000.

Chigira, Junji, to Kanto Seiki Kabushiki Kaisha. Liquid temperature regulator. 4,526,012, Cl. 62-196.300.

Chimura, Toshihiko: *See*—
Okita, Shin; Shimizu, Hideo; Yamazaki, Noriyuki; Sekiguchi, Fumio; Chimura, Toshihiko; and Shinagawa, Osamu, 4,527,208, Cl. 360-85.000.

Chin, Albert K.; and Kinney, Thomas B., to Fogarty, Thomas J. Double lumen dilatation catheter. 4,526,175, Cl. 128-344.000.

Chino, Koichi; Kudo, Kazuhiko; Oda, Akira; Mura, Hideichi; and Takamura, Yoshiyuki, to Hitachi, Ltd. Process and system for treatment of radioactive waste. 4,526,713, Cl. 252-632.000.

Chisso Corporation: *See*—
Chiba, Hiromasa; Harada, Takakiyo; Kumahara, Katsumi; Kawazoe, Shunji; and Sato, Akihiro, 4,526,931, Cl. 525-268.000.

Chloride Group Public Limited Company: *See*—
Pearson, Ernest J., 4,525,926, Cl. 29-623.100.

Chokai, Shoichi: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,526,894, Cl. 514-312.000.

Chong, Hae C., to Franklin Sports Industries, Inc. Sports glove. 4,525,877, Cl. 2-161.00A.

Chorkey, William J. Valve with straight through flow. 4,526,202, Cl. 137-625.660.

Christensen, Richard G.; and Moore, Robert L., to International Business Machines Corporation. Metallization of a ceramic substrate. 4,526,859, Cl. 430-314.000.

Chu, Pochen; and Kuhl, Gunter H., to Mobil Oil Corporation. Hydrothermal zeolite activation. 4,526,880, Cl. 502-71.000.

Chu, Pochen: *See*—
Dwyer, Francis G.; and Chu, Pochen, 4,526,879, Cl. 502-71.000.

Chung, Randall: *See*—
Ambrosius, William H., III; and Chung, Randall, 4,527,233, Cl. 364-200.000.

Churchill, Jeffrey R.; and Hutchinson, Francis G., to Imperial Chemical Industries PLC. Continuous release formulations. 4,526,938, Cl. 525-415.000.

CH_2M Hill, Inc.: *See*—
Hickey, Robert V.; Hickey, Duane B.; and Goetzinger, Charles J., 4,526,463, Cl. 355-83.000.

Cianci, James P., to Kendall Company, The. Liquid drainage system with interlocked handle. 4,526,576, Cl. 604-322.000.

Ciba-Geigy Corporation: *See*—
Seymour, John P.; and Gannon, John A., 4,526,940, Cl. 525-526.000.

Cimenti, Giovanni: *See*—
Legille, Edouard; Bernard, Gilbert; Cimenti, Giovanni; and Thillen, Guy, 4,526,536, Cl. 432-238.000.

CISE-Centro Informazioni Studi Esperienze S.p.A.: *See*—
Corti, Mario; and Parmigiani, Fulvio, 4,526,465, Cl. 356-35.500.

Citizen Watch Company Limited: *See*—
Nakayama, Yasuaki; and Kamiyama, Yasuo, 4,526,476, Cl. 368-189.000.

Ciullo, Jerome V. Ambulation aid having bracket for attaching accessory medical devices. 4,526,187, Cl. 135-66.000.

Claas Ohg: *See*—
Heidjann, Franz; and Dammann, Johannes, 4,526,181, Cl. 130-27.00R.

Clack, Reynalda: *See*—
Sharp, Donald W., 4,526,091, Cl. 98-39.100.

Clamp Swing Pricing Co.: *See*—
Garfinkle, Benjamin L., 4,526,335, Cl. 248-221.400.

Clarion Co., Ltd.: *See*—
Imagawa, Toshiyuki; and Ohara, Kazuya, 4,527,281, Cl. 455-165.000.
Sato, Kazuo, 4,526,802, Cl. 427-8.000.

Clark, John I.; Mengel, Loretta S.; and Benedek, George B., to Massachusetts Institute of Technology. Process for preventing or reversing cataract formation. 4,526,789, Cl. 514-627.000.

Clark, Ralph J., to Williams International Corporation. Oil scavening system for gas turbine engine. 4,525,995, Cl. 60-39.080.

Clark, Stewart A.: *See*—
Carson, John C.; and Clark, Stewart A., 4,525,921, Cl. 29-577.00C.

Claussen, Uwe: *See*—
Arndt, Frank; Claussen, Uwe; Harnisch, Horst; and Schellhammer, Carl-Wolfgang, 4,526,705, Cl. 252-301.320.

Clegg, Warren P. Circular centrifugal pump with arcuate input and output sections. 4,526,517, Cl. 417-355.000.

Clemens, A. H.; and Hough, David L., to Miles Laboratories, Inc. Diagnostic method and apparatus for clamping blood glucose concentration. 4,526,568, Cl. 604-4.000.

Clements, Trevor F., to Hurley Moate Engineering Company Limited. Apparatus and method for joining webs. 4,526,638, Cl. 156-159.000.

Cline, Harvey E., to General Electric Company. Surface acoustic wave device from eutectic deposit. 4,527,082, Cl. 310-313.00B.

Clinton, Albert J.: *See*—
O'Doherty, George O. P.; and Clinton, Albert J., 4,526,997, Cl. 560-21.000.

Coal Industry (Patents) Ltd.: *See*—
Robinson, Joseph G.; and Barnes, David I., 4,526,767, Cl. 423-329.000.

Cochran, Daniel M.; and Wyttenbach, William H. Home carbonating apparatus. 4,526,730, Cl. 261-121.00R.

Cohen, Karen L., to AT&T Bell Laboratories. Method of administering local and end-to-end acknowledgments in a packet communication system. 4,527,267, Cl. 370-60.000.

Cohnen, Erich; and Armah, Ben, to Beiersdorf Aktiengesellschaft. Hypertensive isoindolin-2-yl-aminoimidazolines and isoindolin-2-yl-guanidines. 4,526,897, Cl. 514-392.000.

Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, to Beecham Group p.l.c. Antibiotic from *S. clavuligerus*. 4,526,783, Cl. 424-114.000.

Coleman, James P.; Hallcher, Richard C.; Rogers, Thomas E.; and McMackins, Dudley E., to Monsanto Company. Synthesis of γ-vinyl-γ-butyrolactone from acetoxyhexenoic acids. 4,526,990, Cl. 549-326.000.

Coletta, John A.: *See*—
Hunt, William V.; Coletta, John A.; Howling, Richard J.; and Higgs, Leonard, 4,525,885, Cl. 5-453.000.

Colgate-Palmolive Company: *See*—
Harvey, Kenneth; and Connors, Stephen T., 4,526,778, Cl. 424-52.000.
Marschner, Frank W.; Kenkare, Divaker B.; and Bowers, James H., 4,526,780, Cl. 424-66.000.
Parr, Richard S.; Ramachandran, Pallassana N.; Grey, Seymour; and Reinish, Martin D., 4,526,702, Cl. 252-174.250.

Colosimo, Joseph A.: *See*—
Harkless, Lloyd B.; McCracken, William L.; and Colosimo, Joseph A., 4,527,055, Cl. 250-234.000.

Combustion Engineering, Inc.: *See*—
Wentzell, Timothy H.; and Kuljis, Zoran, 4,526,037, Cl. 73-640.000.

Comerford, John J.; and Lupoli, Peter J., to Sun Chemical Corporation. Multi-piece clamping shell for electric cigar lighters. 4,527,048, Cl. 219-269.000.

Commissariat a l'Energie Atomique: *See*—
Auchapt, Pierre; and Mathieu, Daniel, 4,526,035, Cl. 73-439.000.
Bruel, Michel; Floccari, Michel, deceased; and Michaud, Jean-Francois, 4,527,044, Cl. 219-121.0EB.

Commons, Thomas J.; and Potoski, John R., to American Home Products Corporation. 2-(3-Amino-5-isoxazolyl)-2-oxyimino-acetic acids. 4,526,977, Cl. 548-246.000.

Commonwealth of Australia, The: *See*—
Catchpole, Brian G., 4,526,141, Cl. 123-51.0BA.

Compagnie Francaise des Petroles: *See*—
Baggio, Jean-Louis; and Saintherant, Patrice, 4,526,596, Cl. 62-40.000.

Connell, Joseph N.: *See*—
Branham, Tillman W., 4,527,111, Cl. 320-26.000.

Connors, Stephen T.: *See*—
Harvey, Kenneth; and Connors, Stephen T., 4,526,778, Cl. 424-52.000.

Continental Can Company: *See*—
Merchant, Harish D.; Morris, James G.; and Scharf, Gunther, 4,526,625, Cl. 148-2.000.

Control Data Corporation: *See*—
Logan, Max C.; and Nordstrom, Jon T., 4,526,011, Cl. 62-176.100.
Van Brunt, Nicholas P., 4,527,249, Cl. 364-578.000.

Cook, James R.; and Dishun, Thomas R., to Armco Inc. Process for preparing rimming or semi-killed steel ingots for rolling into slabs. 4,525,917, Cl. 29-527.700.

Cooke, Arthur V.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,526,911, Cl. 523-445.000.

Cooke, Claude E., Jr.: *See*—
Erbstoesser, Steven R.; Cooke, Claude E., Jr.; Sinclair, Richard G.; and Epstein, Michael M., 4,526,695, Cl. 252-8.55R.

Cooper LaserSonics, Inc.: *See*—
Wuchinich, David G., 4,526,571, Cl. 604-22.000.

Cooper, Ronald H. Fluid injector for internal combustion engine. 4,526,138, Cl. 123-25.00E.

Coq B.V.: *See*—
Boersma, Rintje; van Wijnandsbergen, Marius F. F.; Irik, Gijsbert W.; and Marien, Pieter, 4,527,220, Cl. 361-332.000.

Coras Iompair Eireann: *See*—
Williams, Joseph E., 4,525,951, Cl. 49-47.000.

Cordis Europa N.V.: *See*—
Feijen, Jan; and Hennink, Wilhelmus E., 4,526,714, Cl. 260-112.00R.

Corning Glass Works: *See*—
Andrieu, Andre; Davot, Jean-Pierre P.; and Thibieroz, Jean-Pierre A. M., 4,526,872, Cl. 501-4.000.
Beall, George H.; Borrelli, Nicholas F.; and Morse, David L., 4,526,873, Cl. 501-5.000.
Majestic, Peter J., 4,527,035, Cl. 219-69.00W.
Trotter, Donald M., Jr., 4,526,785, Cl. 428-209.000.

Corti, Mario; and Parmigiani, Fulvio, to CISE-Centro Informazioni Studi Esperienze S.p.A. Apparatus for detecting the displacements of points of excited structures. 4,526,465, Cl. 356-35.500.

Corvent International Limited: *See*—
Snowden, Wesley R.; and Walter, Erhard P., 4,526,277, Cl. 211-46.000.

Cosden Technology, Inc.: *See*—
Searl, Alonzo H.; Hahn, Granville J.; and Rutledge, Raleigh N., 4,526,736, Cl. 264-53.000.

Cothrell, LeRoy E.; and Fair, Raymond G., to Timesavers, Inc. Abrasive belt cleaning system. 4,525,955, Cl. 51-135.00R.

Coulter Electronics, Inc.: *See*—
Coulter, Wallace H., 4,527,114, Cl. 324-71.100.

Coulter Systems Corporation: *See*—
Kuehnle, Manfred R.; Rose, Robert M.; and Ballas, John S., 4,526,357, Cl. 271-18.200.

Coulter, Wallace H., to Coulter Electronics, Inc. Electrical slit scanning apparatus. 4,527,114, Cl. 324-71.100.

Cound, Cary D., to American Home Products Corporation. Feed mechanism for apparatus for evacuating and compacting aerosol cans. 4,526,097, Cl. 100-215.000.

Courtaulds Plc: *See*—
Betts, Max W.; Johnson, Nigel, deceased; Bennett, Ernest W., executor; and Bennett, Joyce H., executor, 4,526,019, Cl. 66-132.00R.

Cox, Paul V., to Castrol Limited. Improvements in the preparation of concentrates for high water based hydraulic fluids. 4,526,697, Cl. 252-75.000.

Crenshaw, Ronnie R.: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,526,973, Cl. 546-235.000.

Cricchi, James R., to Westinghouse Electric Corp. Common memory gate non-volatile transistor memory. 4,527,257, Cl. 365-184.000.

Criscione, John M.: *See*—
Mercuri, Robert A.; and Criscione, John M., 4,526,834, Cl. 428-408.000.

Cristobal, Carlos C.: *See*—
Palacio, Joaquin J.; and Cristobal, Carlos C., 4,525,972, Cl. 52-643.000.

Cronin, Michael J.; and Hamra, Victor W., to Lockheed Corporation. Electrical connector assembly for flat cables. 4,526,432, Cl. 339-75.00M.

Crooks, Hubert B., to Devro, Inc. Method of preparing collagen extrusion gels. 4,526,580, Cl. 8-94.180.

Cross Manufacturing Company (1938) Limited: *See*—
Flower, Ralph F. J., 4,526,387, Cl. 277-198.000.

Culmer, Daniel D.: *See*—
Bittner, Harry J.; Culmer, Daniel D.; and Davis, Walter R., 4,527,128, Cl. 330-9.000.

Cummings, Donald R., to Dut Pty Limited. Process for the production of synthesis gas from coal. 4,526,903, Cl. 518-704.000.

Cunningham, Philip J.; and Slocomb, Leon F., Jr., to Slocomb Industries, Inc. Window locking arrangement. 4,525,952, Cl. 49-449.000.

Cuny, Francis; and Auzary, Louis, to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude. Welding torch with non-consumable electrode and double shielding gas flow and the relevant welding process. 4,527,038, Cl. 219-75.000.

Cut Rate Plastic Hangers, Inc.: *See*—
Zuckerman, Jack M.; and Warmath, John, 4,526,306, Cl. 223-88.000.

Dage, Richard C.: *See*—
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., 4,526,981, Cl. 548-321.000.

d'Agostino, Guy; Dhainaut, Andre; and Maillard, Claude M. J., to S.N.E.C.M.A. Control mechanism for a tridimensional cam. 4,526,087, Cl. 91-61.000.

d'Agostino, Guy; Dhainaut, Andre ; and Petiteau, Jacques A. A., to Society Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". Device for the distribution of a fluid. 4,526,343, Cl. 251-367.000.

Daiichi Kigenso Kagaku Kogyo Co., Ltd.: *See*—
Ito, Kathuhiko; Sugii, Hiroshi; Takata, Yukito; and Kokubu, Kyoichiro, 4,526,765, Cl. 423-306.000.

Dailey Petroleum Services Corp.: *See*—
Anders, Edward O., 4,526,241, Cl. 175-76.000.

d'Alayer de Costemore d'Arc, Stephane, to Staar S.A. Compact disc loading and unloading device with rotationally actuated movable disc support. 4,527,264, Cl. 369-77.100.

d'Alayer de Costemore d'Arc, Stephane A. M., to Staar S. A. Position memory for laser reproduction unit. 4,527,265, Cl. 369-244.000.

Dallavia, Anthony J., Jr., to General Electric Company. Modified silicone release coating compositions. 4,526,953, Cl. 528-15.000.

Dammann, Johannes: *See*—
Heidjann, Franz; and Dammann, Johannes, 4,526,181, Cl. 130-27.00R.

Dana Corporation: *See*—
Oster, Terry L., 4,526,063, Cl. 74-710.500.

Daniels, Robert L., to Ex-Cell-O Corporation. Apparatus and method for finishing radial commutator. 4,525,957, Cl. 51-244.000.

Danilevsky, Mikhail G.: *See*—
Alengoz, Anton S.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; and Shevchenko, Jury A., 4,526,758, Cl. 422-122.000.

Das, Suryya K.; Greigger, Paul P.; Boberski, William G.; Jones, James E.; Schappert, Raymond F.; and Seiner, Jerome A., to PPG Industries, Inc. High-solids coating composition for improved rheology control containing inorganic microparticles. 4,526,910, Cl. 523-220.000.

David, Donald M.; and Morris, Gene R., to Hornady Manufacturing Co. Shell loader. 4,526,084, Cl. 86-38.000.

David, Samuel: *See*—
Thies, Peter W.; and David, Samuel, 4,526,991, Cl. 549-363.000.

Davis, Walter L.: *See*—
Herold, Barry W.; and Davis, Walter L., 4,527,131, Cl. 331-116.0FE.

Davis, Walter R.: *See*—
Bittner, Harry J.; Culmer, Daniel D.; and Davis, Walter R., 4,527,128, Cl. 330-9.000.

Davot, Jean-Pierre P.: *See*—
Andrieu, Andre; Davot, Jean-Pierre P.; and Thibieroz, Jean-Pierre A. M., 4,526,872, Cl. 501-4.000.

Davy-Loewy Limited: *See*—
Holton, James A.; and Inman, James C., 4,526,086, Cl. 91-43.000.

Dawson, Daniel J.: *See*—
Wang, Patricia C.; and Dawson, Daniel J., 4,526,933, Cl. 525-326.800.

Dawson, Marcia I.; Chan, Rebecca L. S.; and Hobbs, Peter D., to SRI International. N-heterocyclic retinoic acid analogues. 4,526,787, Cl. 514-255.000.

Dax Manufacturers Inc.: *See*—
Shultz, Julius, 4,525,945, Cl. 40-152.000.

Day, Gene F., to Xerox Corporation. Ion projection printer with virtual back electrode. 4,527,177, Cl. 346-159.000.

Day, Michael A.; and Reid, Alistair, to Imperial Chemical Industries Plc. Catalyst supports and hydrocarbon conversion processes employing catalysts based on these supports. 4,526,885, Cl. 502-327.000.

Day, William J.: *See*—
Thomas, Calvin J.; and Day, William J., 4,527,049, Cl. 219-449.000.

Dean, Robert R.: *See*—
Oswald, Norman D.; Dean, Robert R.; and Mankey, Harry S., 4,526,344, Cl. 254-9.00C.

Deane, Graham: *See*—
Lester, Graham G.; Brand, Peter J.; and Deane, Graham, 4,526,573, Cl. 604-33.000.

Deardorff, Don L. Catalyst composition and method for the manufacture of esters. 4,526,725, Cl. 556-56.000.

Deconche, Alain; and Van Uffelen, Jean-Pierre H., to U.S. Philips Corporation. Method for correcting the frequency of a local carrier

in a receiver of a data transmission system and receiver using this method. 4,527,278, Cl. 375-97.000.
De Filippis, Pietro; Salvatore, Amedeo; Calenda, Ciro; and Notaro, Giuseppe, to Texas Instruments Incorporated. Delayed-action thermal relay. 4,527,142, Cl. 337-105.000.
Deguchi, Katsuhiko: *See*—
Fujisawa, Noriyoshi; Ooshima, Katsuaki; Iijima, Junko; and Deguchi, Katsuhiko, 4,526,710, Cl. 252-545.000.
DeGuvera, Emmett W., to Detroit Punch & Retainer Corporation. Heavy duty punch. 4,526,077, Cl. 83-686.000.
Delalande S.A.: *See*—
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,526,786, Cl. 514-240.000.
De Lena, Oscar: *See*—
Cestaro, Massimo; and De Lena, Oscar, 4,527,164, Cl. 343-713.000.
Dellinger, Eugene L. Orthodontic apparatus and method for treating malocclusion. 4,526,540, Cl. 433-24.000.
Delmege, James W.: *See*—
Caplan, Jerome S.; Delmege, James W.; Laman, Robert R.; and Navarro, Christine, 4,527,012, Cl. 179-18.0ES.
Delourme, Raymond; Detienne, Jean-Louis; Komornicki, Jacques; and Tellier, Jacques, to Societe Nationale Elf Aquitaine (Production). Flotation of minerals. 4,526,696, Cl. 252-61.000.
Dentsply Research & Development Corp.: *See*—
Harrod, Christopher G. C., 4,526,303, Cl. 222-386.500.
Welsh, Richard E., 4,526,490, Cl. 401-183.000.
Deregibus, Alfio, to Goodyear Tire & Rubber Company, The. Equipment for producing continuous tape of rubbery vulcanizable material for the manufacture of hose articles. 4,526,640, Cl. 156-242.000.
de Ronde, Frans C., to U.S. Philips Corporation. Miniature horn antenna array for circular polarization. 4,527,165, Cl. 343-778.000.
DeSoto, Inc.: *See*—
Lewarchik, Ronald J.; Murray, Kevin P.; Donovan, Marcella G.; and Jones, Arthur T., 4,526,939, Cl. 525-438.000.
Sekmakas, Kazys; and Shah, Raj, 4,526,915, Cl. 524-83.000.
Detienne, Jean-Louis: *See*—
Delourme, Raymond; Detienne, Jean-Louis; Komornicki, Jacques; and Tellier, Jacques, 4,526,696, Cl. 252-61.000.
Detroit Punch & Retainer Corporation: *See*—
DeGuvera, Emmett W., 4,526,077, Cl. 83-686.000.
Deur, Michel, to Sandoz Ltd. Dioxazine pigments. 4,526,963, Cl. 544-74.000.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Extended harmonics in a polyphonic tone synthesizer. 4,526,081, Cl. 84-1.230.
Deutsch, Reinhard: *See*—
Hoffmann, Gottfried; Deutsch, Reinhard; and Pohl, Klaus-Jurgen, 4,526,268, Cl. 198-419.000.
Deutsche Babcock Aktiengesellschaft: *See*—
Mischke, Walter, 4,526,111, Cl. 110-245.000.
Deutsche Geratebau GmbH: *See*—
Huster, Bernhard, 4,526,032, Cl. 73-245.000.
Deutsche Gesellschaft etc.: *See*—
Schroder, Gunter, 4,526,311, Cl. 228-119.000.
Deutsche Gesellschaft fur Wiederaufarbeitung von Kerbrennstoffen mbH: *See*—
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, 4,527,068, Cl. 250-507.100.
Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See*—
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, 4,527,066, Cl. 250-507.100.
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, 4,527,067, Cl. 250-507.100.
Popp, Franz-Wolfgang; and Rosenbach, Klaus, 4,527,065, Cl. 250-506.100.
DeVries, James H., to Baxter Travenol Laboratories, Inc. Fluid pumping assembly including a prepackaged fluid circuit module. 4,526,515, Cl. 417-63.000.
Devro, Inc.: *See*—
Crooks, Hubert B., 4,526,580, Cl. 8-94.180.
Dhainaut, Andre: *See*—
d'Agostino, Guy; Dhainaut, Andre; and Maillard, Claude M. J., 4,526,087, Cl. 91-61.000.
d'Agostino, Guy; Dhainaut, Andre ; and Petiteau, Jacques A. A., 4,526,343, Cl. 251-367.000.
Diamond, Jeffrey H.: *See*—
Winkler, David S.; and Diamond, Jeffrey H., 4,526,913, Cl. 524-31.000.
Dichter, Hans-Joachim. Appliance for feeding glass tubes to glass-processing machines. 4,526,270, Cl. 198-453.000.
Dickerson, Richard C., to Gulf Oil Corporation. Hydraulic packer assembly. 4,526,229, Cl. 166-120.000.
Dickhart, William W., III, to Budd Company, The. Laterally damped railway car. 4,526,109, Cl. 105-199.00R.
DiDomenico, Robert A., to AMSAC Industries, Incorporated. Timing control mechanism for a fuel injection pump. 4,526,154, Cl. 123-502.000.
Diesel Equipment Limited: *See*—
Martin, John C.; and Martin, Paul, 4,526,197, Cl. 137-596.200.
Martin, John C., 4,526,418, Cl. 296-182.000.
Diesel Kiki Co., Ltd.: *See*—
Swain, James C.; and Yates, Jan B., 4,526,516, Cl. 417-222.000.
Diethelm, Adolf. Structural element for the manufacture of casings, wall disks, boxes and such articles. 4,525,964, Cl. 52-309.110.
Dietz, Keith A., to Stewart Engineering & Equipment Co., Inc. Dual-T transfer conveyor. 4,526,266, Cl. 198-357.000.
Digital Equipment Corporation: *See*—
Ermolovich, Thomas R., 4,527,236, Cl. 364-200.000.
Dimitracopoulos, Panayotis C.: *See*—
Carden, John C.; Dimitracopoulos, Panayotis C.; and Arnold, George D. M., 4,526,064, Cl. 74-804.000.
Dinkel, Kurt; and Endpess, Rudolf, to Dinkel, Kurt. Body, particularly for truck, having a back foldable sidewall. 4,526,417, Cl. 296-181.000.
di Salle, Enrico: *See*—
Salvati, Patricia; Caravaggi, Anna M.; Temperilli, Aldemio; Bosisio, Germano; Sapini, Osvaldo; and di Salle, Enrico, 4,526,892, Cl. 514-288.000.
Dishun, Thomas R.: *See*—
Cook, James R.; and Dishun, Thomas R., 4,525,917, Cl. 29-527.700.
Disteldorf, Josef; zur Hausen, Manfred; Hubel, Werner; and Kriebel, Gunter, to Chemische Werke Huls Aktiengesellschaft. Process for the production of polyalkylpiperidylamines. 4,526,971, Cl. 546-186.000.
Dixon Industries Corporation: *See*—
Marshall, Charles R., 4,526,388, Cl. 277-206.000.
Dixon, Robert W., to Chas. M. Bailey Co., Inc. Discharge valve. 4,526,192, Cl. 137-244.000.
Djordjevic, Ilija; and Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump. 4,526,146, Cl. 123-357.000.
DL Process Co.: *See*—
Bachman, Burl A., 4,526,098, Cl. 101-115.000.
Doboy Packaging Machinery, Inc.: *See*—
Matt, Timothy S., 4,525,977, Cl. 53-55.000.
Dr. Johannes Heidenhain GmbH: *See*—
Burkhardt, Horst; and Nelle, Gunther, 4,527,056, Cl. 250-237.00G.
Dodson, Matt R.: *See*—
Nawrocki, Nicholas F.; and Dodson, Matt R., 4,527,156, Cl. 340-753.000.
Dolin, Rick L., to Manville Service Corporation. Whitewater formulation containing a cationic polyacrylamide. 4,526,914, Cl. 524-42.000.
Donaldson, Darrel D.; Honnigford, Edward H.; and Poeppelman, Alan D., to NCR Corporation. High voltage pass circuit. 4,527,074, Cl. 307-246.000.
Donnan, Jeremy F.; and Reed, David A., to Boots Company PLC, The. Medical connector. 4,526,572, Cl. 604-29.000.
Donnellan, Gerald L.: *See*—
French, Pierre B.; Antcliffe, David L.; and Donnellan, Gerald L., 4,526,004, Cl. 60-602.000.
Donohue, James M.; and Ling, Andrew T., to Xerox Corporation. Character generator. 4,527,252, Cl. 364-900.000.
Donovan, Marcella G.: *See*—
Lewarchik, Ronald J.; Murray, Kevin P.; Donovan, Marcella G.; and Jones, Arthur T., 4,526,939, Cl. 525-438.000.
Dorleijn, Jan W. F.: *See*—
van der Heijden, Rudolf L. A.; and Dorleijn, Jan W. F., 4,527,097, Cl. 315-246.000.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See*—
Kubota, Kanya; Yamana, Hajimu; and Takeda, Seiichiro, 4,526,658, Cl. 203-13.000.
Dostert, Phillippe L.: *See*—
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,526,786, Cl. 514-240.000.
Douzon, Colette A.: *See*—
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Dovey, Dennis J. Camera support. 4,526,308, Cl. 224-265.000.
Dow Chemical Company, The: *See*—
Fuentes, Ricardo, Jr.; and Esneault, Calvin P., 4,526,943, Cl. 526-133.000.
McKinley, Mark J.; and Applegath, Douglas D., 4,526,240, Cl. 175-72.000.
Peet, Norton P.; and Sunder, Shyam, 4,526,890, Cl. 514-248.000.
Weber, Christian A.; and Paige, William P., 4,526,926, Cl. 525-67.000.
Dow Corning Corporation: *See*—
Owen, Michael J., 4,526,680, Cl. 209-166.000.
Dowden, Barry F.; Barclay, Donald J.; and Kirkman, David H., to International Business Machines Corporation. Method and electrolytic display for selectively displaying an image. 4,526,441, Cl. 350-357.000.
Drach, Edward. Security cap assembly and actuator. 4,526,193, Cl. 137-296.000.
Dresser Industries, Inc.: *See*—
Primdahl, Richard D., 4,526,204, Cl. 137-637.000.
Du Pont Canada Inc.: *See*—
White, George, 4,526,916, Cl. 524-128.000.
Du Pont-Mitsui Polychemicals Co., Ltd.: *See*—
Kutsuwa, Yoshikazu; Kitahara, Kouji; and Ishii, Toshiyuki, 4,526,707, Cl. 252-511.000.
Dublet, Guy P., to Etablissement Public de Diffusion dit "Telediffusion de France". Structure of an access point toward a data pack broadcasting network. 4,527,268, Cl. 370-94.000.
DuBois, R. Clark. Document turnover device. 4,526,361, Cl. 271-186.000.
Dumoulin, Andre ; Seguin, Marc; and Bouffard, Jean, to Northern Telecom Limited. Twisting machine. 4,525,993, Cl. 57-58.520.
Dunau, Mark J. Paint brush holder. 4,525,889, Cl. 15-146.000.

Dunlop Limited: *See—*
Fennell, Thomas G.; and Fisher, Ronald, 4,526,616, Cl. 75-234.000.
Dunn, Richard G. Rubber boat stern support device. 4,526,126, Cl. 114-365.000.
Dunnavant, William R.; Langer, Heimo J.; and Sedgwick, Grant O., to Ashland Oil, Inc. Process of forming foundry cores and molds utilizing binder curable by free radical polymerization. 4,526,219, Cl. 164-16.000.
Du Pont de Nemours, E. I., and Company: *See—*
Resnick, Paul R., 4,526,948, Cl. 526-247.000.
Strohmaier, Alfred J., 4,526,808, Cl. 427-57.000.
Subramanyam, Vinayakam; and Rajeckas, Algis, 4,526,776, Cl. 424-1.100.
Tang, Chaucer C., 4,526,993, Cl. 549-445.000.
Wilkinson, William K., 4,526,935, Cl. 525-345.000.
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Ulrich, Lawrence W.; and Walker, Connie W., 4,525,980, Cl. 53-374.000.
Duracell Inc.: *See—*
Kearney, Susan D.; and Moses, Peter R., 4,526,846, Cl. 429-194.000.
Durette, Philippe L.; and Gallagher, Timothy F., to Merck & Co., Inc. Lipoxygenase inhibitors. 4,526,999, Cl. 514-549.000.
Durham, Roger O. Chain engagement slot for bicycle sprockets. 4,526,558, Cl. 474-152.000.
Durivault, Jean; and Branche, Bernard, to Nadella. Orientable pivot in particular for a television set. 4,526,336, Cl. 248-349.000.
Durr, Frederick E.: *See—*
Murdock, Keith C.; and Durr, Frederick E., 4,526,989, Cl. 549-316.000.
Durvasula, Visweswara R., to Upjohn Company, The. Autoxidation of alkyl-substituted aromatic ethers. 4,526,984, Cl. 549-241.000.
Dut Pty Limited: *See—*
Cummings, Donald R., 4,526,903, Cl. 518-704.000.
Dutt, Herber: V.; and Santostasi, Paul A., to Sun Coast Plastics, Inc. Tamper proof closure cap, method, and tool for making same. 4,526,282, Cl. 215-252.000.
Duverne, Jean-Claude M. Apparatus for pumping a viscous mass. 4,526,514, Cl. 417-61.000.
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, to Feldmuhle Aktiengesellschaft. Thermal insulation lining of ceramic material for a hot gas duct enveloped in metal. 4,526,824, Cl. 428-35.000.
Dwyer, Francis G.; and Chu, Pochen, to Mobil Oil Corporation. Synthesis of zeolite ZSM-5. 4,526,879, Cl. 502-71.000.
Dyar, Harrison G. Thermal insulating system particularly adapted for building construction. 4,525,969, Cl. 52-407.000.
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Concrete shielding housing for receiving and storing a nuclear fuel element container. 4,527,066, Cl. 250-507.100.
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Concrete shielding housing for receiving and storing a nuclear fuel element container. 4,527,067, Cl. 250-507.100.
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kerbrennstoffen mbH. Concrete shielding housing for receiving and storing a nuclear fuel element container. 4,527,068, Cl. 250-507.100.
Dynapol: *See—*
Wang, Patricia C.; and Dawson, Daniel J., 4,526,933, Cl. 525-326.800.
E.G.O. Elektro-Gerate Blanc und Fischer: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
Hall, Steven E.; and Haslanger, Martin F., 4,526,900, Cl. 514-469.000.
Nakane, Masami, 4,526,901, Cl. 514-469.000.
Eagle Tractor Company, Inc.: *See—*
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Early, Jack J.: *See—*
Burns, Kenneth R.; and Early, Jack J., 4,526,001, Cl. 60-274.000.
Easco Corporation: *See—*
Cecil, Richard L., 4,526,069, Cl. 81-177.850.
Eastern Safety Equipment Co., Inc.: *See—*
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Eastman Kodak Company: *See—*
Edwards, Ray, 4,526,919, Cl. 524-232.000.
Gupta, Mool C.; Wrobel, Joseph J.; and Strome, Forrest C., Jr., 4,527,173, Cl. 346-135.100.
Morris, John C.; and Jackson, Winston J., Jr., 4,526,822, Cl. 428-35.000.
Ricards, John D., 4,527,212, Cl. 360-121.000.
Upson, Donald A.; and Steklenski, David J., 4,526,706, Cl. 252-500.000.
Eaton Corporation: *See—*
Baltare, Gunnar, 4,526,254, Cl. 188-341.000.
Link, Donald A.; Swessel, John A., Jr.; and Theisen, Peter J., 4,527,027, Cl. 200-144.00R.
Mueller, Robert S., 4,526,257, Cl. 192-48.200.
Ebenal, Harry R., deceased; and by Ritter, Gladys M., executrix. Support garment for males. 4,526,167, Cl. 128-158.000.
Ebi, Yutaka: *See—*
Iwasaki, Kyuhachiro; Ameyama, Minoru; Ebi, Yutaka; Jinnai, Koichiro; and Sato, Tsutomu, 4,527,170, Cl. 346-75.000.
Ebihara, Ben T., to United States of America, National Aeronautics and Space Administration. Multistage spent particle collector and a method for making same. 4,527,092, Cl. 315-5.380.
Echte, Adolf: *See—*
Hambrecht, Juergen; Brandstetter, Franz; Ziegler, Walter; Muller, Wolfgang F.; Bronstert, Klaus; and Echte, Adolf, 4,526,927, Cl. 525-68.000.
Ecole Superieure d'Electricite and Enertec: *See—*
Sorba, Antoine; Attal, Gerard J.; Seignier, Georges B.; and Hamad, Ahmed M., 4,527,116, Cl. 324-77.00B.
Edwards, Ralph W., to General Motors Corporation. Moisture seal in power operated vehicle antenna. 4,527,168, Cl. 343-901.000.
Edwards, Ray, to Eastman Kodak Company. Polyolefin extrusion coating compositions having good coatability and good adhesion to the substrate. 4,526,919, Cl. 524-232.000.
EerNisse, Errol P.; Gaiser, Mark D.; Hanley, John P.; Kistler, Walter P.; Paros, Jerome M.; and Wiggins, Robert B., to Ohaus Scale Corporation. Weighing scale transducer. 4,526,247, Cl. 177-210.0FP.
Eertink, Bastiaan B. B., to Oce-Nederland B.V. Copying machine control system. 4,526,461, Cl. 355-14.00R.
Egli, Werner H.; Lim, Wah L.; and Weber, Mark W., to Honeywell Inc. Discriminant apparatus for laser gyros. 4,526,469, Cl. 356-350.000.
Egorov, Vitaly V.: *See—*
Bykov, Anatoly P.; Orlov, Anatoly A.; Gribanov, Dmitry D.; Kulesh, Vladimir P.; Fonov, Sergei D.; Egorov, Vitaly V.; Moskalik, Leonid M.; Martynov, Apollinary K.; and Ryadchikov, Vladimir E., 4,526,471, Cl. 356-373.000.
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Kothe, Norbert; and Eichentopf, Bertram, 4,526,715, Cl. 260-112.00B.
Eicher Associates, Inc.: *See—*
Eicher, George J., 4,526,494, Cl. 405-83.000.
Eicher, George J., to Eicher Associates, Inc. Penstock fish diversion system. 4,526,494, Cl. 405-83.000.
Eide, Svein, to Ardal Og Sunndal Verk a.s. Three-layer metal laminate with bimetallic effect, and the application of this laminate in cooking vessels. 4,526,842, Cl. 428-617.000.
Eisen- und Drahtwerk Erlau Aktiengesellschaft: *See—*
Muller, Anton; Konig, Hubert; and Herdeg, Karl, 4,525,900, Cl. 24-68.0CT.
Eisenkolb, Roland: *See—*
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Eklund, Vidar: *See—*
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Ekman, Kurt: *See—*
Selin, Johan; Huttunen, Jouko; Turunen, Olli; Eklund, Vidar; and Ekman, Kurt, 4,526,620, Cl. 106-203.000.
El Paso Hydrocarbons Company: *See—*
Mehra, Yuv R., 4,526,594, Cl. 62-17.000.
Electromechanical Research Laboratories, Inc.: *See—*
Wilkins, Larry C., 4,525,931, Cl. 33-147.00T.
Elhaus, Friedrich W. Method and an apparatus for shearing heated metal bars to billets. 4,526,073, Cl. 83-15.000.
Eli Lilly and Company: *See—*
Hertel, Larry W., 4,526,988, Cl. 549-313.000.
Elkem A/S: *See—*
Krogsrud, Harald, 4,526,224, Cl. 165-1.000.
Elkem Chemicals, Inc.: *See—*
Myhren, Jan; and Gitlestad, Svein E., 4,526,678, Cl. 209-2.000.
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Ellis, John R.: *See—*
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Elmwood Sensors Limited: *See—*
Hansen, Jorgen, 4,526,481, Cl. 374-144.000.
Elsenbaumer, Ronald L.; Miller, Granville G.; and Toth, James E., to Allied Corporation. Irreversible donor doping of conjugated backbone polymers. 4,526,708, Cl. 252-518.000.
Elsner, Burckhardt: *See—*
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Emani, Raghuram J.: *See—*
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Emerson Electric Company: *See—*
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Norota, Susumu; Segawa, Yasuhiko; Kiriyama, Tsutomu; Emi, Shingo; Imoto, Tadasi; and Yamauchi, Tetsuo, 4,526,735, Cl. 264-27.000.
Emil Steidle GmbH & Co.: *See—*
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Empie, Howard L., Jr., to International Paper Co. Recovery of heat and chemical values from spent pulping liquors. 4,526,760, Cl. 422-185.000.

Encon Products, Inc.: *See*—
Simpson, Harold G., 4,525,967, Cl. 52-404.000.
Simpson, Harold G., 4,525,976, Cl. 52-748.000.
Enda, Toyoaki, to Iwatsu Electric Co., Ltd. Linear actuator with magnets. 4,527,108, Cl. 318-687.000.
Endo, Akira; and Kimura, Katsuhiro, to Hitachi, Ltd. Doppler radar type speedometer. 4,527,160, Cl. 343-8.000.
Endo, Kazuyuki: *See*—
Maeda, Muneyoshi; Endo, Kazuyuki; and Tansei, Hikaru, 4,526,217, Cl. 152-527.000.
Endpess, Rudolf: *See*—
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Engelhard Corporation: *See*—
Beshty, Bahjat S.; Hatfield, W. Robert; Lee, Hyo C.; Heck, Ronald M.; and Hsiung, Thomas H., 4,526,614, Cl. 75-83.000.
Burns, Kenneth R.; and Early, Jack J., 4,526,001, Cl. 60-274.000.
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English Electric Valve Company Limited: *See*—
Menown, Hugh; Newton, Barry P.; and Neale, Christopher V., 4,527,090, Cl. 313-592.000.
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Byerley, John J.; and Enns, Kurt, 4,526,662, Cl. 204-86.000.
Enns, Silvanus T. Large conveyor assemblies for detachable mounting to a tractor. 4,526,265, Cl. 198-318.000.
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, to Nippon Shinyaku Co. Ltd. Pharmaceutically active 4-hydroxy-3-benzoyl-2-quinolone derivatives. 4,526,894, Cl. 514-312.000.
Enomoto, Ryo, to Ibigawa Electric Industry Co., Ltd. Process for the production of silicon carbide sintered bodies. 4,526,734, Cl. 264-13.000.
Epson Corporation: *See*—
Hoshikawa, Jun; Iwashita, Yukihiro; and Suzuawa, Osamu, 4,526,818, Cl. 428-1.000.
Epstein, Michael M.: *See*—
Erbstoesser, Steven R.; Cooke, Claude E., Jr.; Sinclair, Richard G.; and Epstein, Michael M., 4,526,695, Cl. 252-8.55R.
Erbstoesser, Steven R.; Cooke, Claude E., Jr.; Sinclair, Richard G.; and Epstein, Michael M., to Exxon Production Research Co. Composition for reducing the permeability of subterranean formations. 4,526,695, Cl. 252-8.55R.
ERCO Industries Limited: *See*—
Ryan, Kevin P.; and Yank, Carl D., 4,526,766, Cl. 423-322.000.
Erico Products, Inc.: *See*—
Kies, Anton M., 4,526,437, Cl. 339-272.00R.
Kies, Anton M.; and Samas, Mark V., 4,526,496, Cl. 408-179.000.
Ericsson, Sylve J. D. Arrangement for drying printed material. 4,526,101, Cl. 101-416.00R.
Eriksson, Sune; and Santen, Sven, to SKF Steel Engineering AB. Method of manufacturing ferrosilicon. 4,526,612, Cl. 75-10.00R.
Erkki Niskanen Oy: *See*—
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Erlandsson, Kjell I.; and Weishar, William B., to Kelley Company, Inc. Counterbalancing mechanism for the ramp of a dockboard. 4,525,887, Cl. 14-71.300.
Ermolovich, Thomas R., to Digital Equipment Corporation. Communications device for data processing system. 4,527,236, Cl. 364-200.000.
Escallon, Eduardo C., to Ball Corporation. Method for providing sheet metal stock with finely divided powder. 4,526,804, Cl. 427-32.000.
Escher Wyss GmbH: *See*—
Wuhrer, Wolfgang, 4,525,916, Cl. 29-446.000.
Esneault, Calvin P.: *See*—
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Essert, Robert D., to Allied Corporation. Alignment sleeve for fiber optic connectors. 4,526,438, Cl. 350-96.200.
Etablissement Public de Diffusion dit "Telediffusion de France": *See*—
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Etablissements Morelateliers Electromecanique De Favieres: *See*—
Morel, Andre; and Morel, Jacques, 4,526,295, Cl. 222-82.000.
Etablissements NATIVELLE S.A.: *See*—
Jarreau, Francois-Xavier; and Koenig, Jean-Jacques, 4,526,895, Cl. 514-341.000.
Ethyl Corporation: *See*—
Burton, Lester P. J., 4,526,918, Cl. 524-150.000.
Hornbaker, Edwin D.; and Jones, Jesse D., 4,526,923, Cl. 524-502.000.
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Eurobond (1984) Limited: *See*—
Beer, Michael W., 4,526,634, Cl. 156-64.000.
Evans, Michael E., to Owens-Corning Fiberglas Corporation. Insulated wall construction. 4,525,970, Cl. 52-454.000.
Evans, Robert H.; Espersen, Charles H.; and Tsai, John W., to AM International, Inc. Sheet feeding mechanism for duplicating machine with duplexing capability. 4,526,364, Cl. 271-272.000.
Evanson, Delbert L.: *See*—
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Evergreen Industries, Inc.: *See*—
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Everitt, Delmar K.: *See*—
Goldfarb, Adolph E.; and Everitt, Delmar K., 4,526,554, Cl. 446-429.000.
EVG Entwicklungs- und Verwertungs-Gesellschaft m.b.H.: *See*—
Ritter, Klaus; Ritter, Gerhard; Schmidt, Gerhard; and Ritter, Josef, 4,526,025, Cl. 72-388.000.
Ewing, John J.: *See*—
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Daniels, Robert L., 4,525,957, Cl. 51-244.000.
Excelermatic Inc.: *See*—
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Exxon Production Research Co.: *See*—
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Exxon Research and Engineering Co.: *See*—
Gupta, Ramesh, 4,526,757, Cl. 422-106.000.
Lundberg, Robert D.; and Weiss, Robert A., 4,526,951, Cl. 526-240.000.
Ezekiel, Frederick D. Magnetic disc liquid supporting. 4,526,381, Cl. 277-80.000.
Fabian, Gordon R.: *See*—
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Fabian, Walter, to Raytheon Company. Forming sub-micron electrodes by oblique deposition. 4,525,919, Cl. 29-571.000.
Facet Enterprises, Inc.: *See*—
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Fantone, Stephen D.; Goward, Robert M.; and Kaplan, Jonathan I., to Polaroid Corporation. Viewfinder apparatus. 4,526,444, Cl. 350-501.000.
Fantone, Stephen D., to Polaroid Corporation. Apparatus and methods for testing lens structure. 4,526,467, Cl. 356-124.000.
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Salesky, Leonard, 4,526,179, Cl. 128-776.000.
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, to Rhone-Poulenc Sante. Cephalosporin derivatives. 4,526,962, Cl. 544-016.000.
Farmitalia Carlo Erba, S.p.A.: *See*—
Salvati, Patricia; Caravaggi, Anna M.; Temperilli, Aldemio; Bosisio, Germano; Sapini, Osvaldo; and di Salle, Enrico, 4,526,892, Cl. 514-288.000.
Farrell, Christopher J.; and Williams, Mark A., to American Can Company. Laminate structure for collapsible dispensing container. 4,526,823, Cl. 428-35.000.
Fast, Jacob J. Product identification tag. 4,525,944, Cl. 40-124.100.
Faulring, Gloria M., to Union Carbide Corporation. Production of alloy steels using chemically prepared V_2O_3 as a vanadium additive. 4,526,613, Cl. 75-12.000.
FDO Technische Adviseurs B.V.: *See*—
van Degeer, Peter M., 4,527,072, Cl. 290-55.000.
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Fedders, Merle. Massager. 4,526,163, Cl. 128-56.000.
Federal Paper Board Co., Inc.: *See*—
Sutherland, Robert L., 4,526,316, Cl. 229-40.000.
Feijen, Jan; and Hennink, Wilhelmus E., to Cordis Europa N.V. Conjugates of anticoagulant and protein. 4,526,714, Cl. 260-112.00R.
Felcht, Utz H.: *See*—
Perplies, Eberhard; and Felcht, Utz H., 4,526,961, Cl. 536-98.000.
Feldman, Barry J., to United States of America, Energy. Isotope separation apparatus and method. 4,526,664, Cl. 204-157.10R.
Feldmuhle Aktiengesellschaft: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,526,824, Cl. 428-35.000.
Felix, Noel F.; and Vermeylen, Guido C., to Metallurgie Hoboken-Overpelt. Process for producing sulphuric acid. 4,526,768, Cl. 423-531.000.
Fennell, Thomas G.; and Fisher, Ronald, to Dunlop Limited. Load-bearing thermal insulator. 4,526,616, Cl. 75-234.000.
Fenton, Frank A., to Emhart Industries, Inc. Mould arrangement for a cyclicly-operating glassware container manufacturing machine with temperature sensing means. 4,526,604, Cl. 65-158.000.
Ferag AG: *See*—
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Raj, Kuldip; and Gowda, Hanumaiah L., 4,526,380, Cl. 277-80.000.
Raj, Kuldip; and Gowda, Hanumaiah L., 4,526,382, Cl. 277-80.000.
Stahl, Philip; Fuller, Dudley D.; and Rippel, Harry C., 4,526,484, Cl. 384-133.000.

Ferziger, Daniel; and Lippman, Jerry, to Ferziger, Daniel. Coated fabric and mattress ticking. 4,526,830, Cl. 428-268.000.

Fey, Robert M.; and Altnau, Ronald L., to Speed Queen Company. Tiltable washer. 4,526,020, Cl. 68-3.00R.

Fiat Auto S.p.A.: *See*—
Ausiello, Francesco P., 4,527,071, Cl. 290-4.00R.

Fiber Materials, Inc.: *See*—
Pepper, Roger T.; Nelson, Daniel C.; and Lewing, Douglas S., 4,526,770, Cl. 423-447.400.

Fichtel & Sachs AG: *See*—
Schierling, Bernhard, 4,526,260, Cl. 192-106.200.

Fidelman, David: *See*—
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Field, David J., to Alcan International Limited. Heat treatment of aluminium alloys. 4,526,630, Cl. 148-159.000.

Fieldcrest Mills, Inc.: *See*—
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Fieldhouse, Raymond, to Lloyd Matheson, Inc. Key forming machine. 4,526,498, Cl. 409-82.000.

Fields, Ellis K.; and Winzenburg, Mark L., to Standard Oil Company (Indiana). Halomethyl, methyl maleic anhydride and synthesis of bromomethyl, methyl maleic anhydride. 4,526,986, Cl. 549-254.000.

Fields, Melvin C.; and Fields, Paul F., to Process Supply Company, Inc. Portable facility for processing granulated sugar into liquid sucrose and invert sugar. 4,526,621, Cl. 127-1.000.

Fields, Paul F.: *See*—
Fields, Melvin C.; and Fields, Paul F., 4,526,621, Cl. 127-1.000.

Filbey, Allen H.: *See*—
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Fingerle, Dieter: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,526,824, Cl. 428-35.000.

Finke, Manfred; Rupp, Walter; and Weiss, Erwin, to Hoechst Aktiengesellschaft. 2-Acrylamido- and 2-methacrylamido-2-methyl propanephosphonic acids and their salts, process for the preparation thereof, and use thereof for the manufacture of copolymers. 4,526,728, Cl. 260-502.50R.

Finnighan, Francis M., to Alfa-Laval Cheese Systems Limited. Slat conveyor. 4,526,271, Cl. 198-648.000.

Firestone Tire & Rubber Company, The: *See*—
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Fischer, Franz, to Siemens Aktiengesellschaft. Integrated semiconductor circuits with contact interconnect levels comprised of an aluminum/silicon alloy. 4,527,184, Cl. 357-67.000.

Fischer, Glenn N. Windshield wiper control system with improved precipitation sensor. 4,527,106, Cl. 318-483.000.

Fischer, Werner; Flaig, Ulrich; Hettich, Gerhard; and Locher, Johannes, to Robert Bosch GmbH. Short-circuit-protected evaluation circuit of high stability for variable inductance transducers. 4,527,121, Cl. 324-207.000.

Fisher, Don J.; and North, Donald F., to Peerless Manufacturing Company. Filter tube gasket. 4,526,378, Cl. 277-12.000.

Fisher, Ronald: *See*—
Fennell, Thomas G.; and Fisher, Ronald, 4,526,616, Cl. 75-234.000.

Fisons plc: *See*—
Stevenson, Neil A., 4,526,899, Cl. 514-456.000.

Fitzpatrick, Stephen T.; and Krawiec, Richard M., to Occidental Chemical Corporation. Polyvinyl chloride suspension polymerization process and product having improved plasticizer absorption. 4,526,946, Cl. 526-202.000.

Flabeg GmbH: *See*—
Seitz, Rudolf, 4,527,047, Cl. 219-219.000.

Flaig, Ulrich: *See*—
Fischer, Werner; Flaig, Ulrich; Hettich, Gerhard; and Locher, Johannes, 4,527,121, Cl. 324-207.000.

Flamme, Jean-Marie G.: *See*—
Leroy, Andre R.; and Flamme, Jean-Marie G., 4,525,891, Cl. 15-250.230.

Fleck, Fritz; Mercer, Alec V.; and Oates, Malcolm, to Sandoz Ltd. Thieno[3,2-b]benzofuran and benzothiophene derivatives useful as optical brightening agents. 4,526,976, Cl. 548-159.000.

Fleming, Ted D.; Koch, Dan A.; McGill, Francis R.; Powers, Ray P.; and Michaelsen, Roy H., to McGill, Stephen T.; and McGill, Francis R. Proportional fluid exchanger and recirculator. 4,526,318, Cl. 236-49.000.

Flider, Frank S., to Justrite Manufacturing Company. Fill gauge for safety and waste disposal drums. 4,526,033, Cl. 73-322.000.

Floccari, Henriette, administratrix: *See*—
Bruel, Michel; Floccari, Michel, deceased; and Michaud, Jean-Francois, 4,527,044, Cl. 219-121.0EB.

Floccari, Michel, deceased: *See*—
Bruel, Michel; Floccari, Michel, deceased; and Michaud, Jean-Francois, 4,527,044, Cl. 219-121.0EB.

Flower, Ralph F. J., to Cross Manufacturing Company (1938) Limited. Rotatable shaft seals. 4,526,387, Cl. 277-198.000.

FloWind R & D Partnership: *See*—
Sisson, Steve S.; Tremoulet, Olivier L., Jr.; and Mercer, John E., 4,525,911, Cl. 29-156.80R.

FMC Corporation: *See*—
Bargiel, Douglas A.; Assony, Edward M.; Ha, Truong M.; and Rosseau, Richard B., 4,525,888, Cl. 15-83.000.
Brown, Richard A., 4,526,762, Cl. 423-63.000.
Jones, Charles E.; and Weiss, Mark A., 4,526,699, Cl. 252-99.000.
Kondo, Kiyoshi; Takashima, Toshiyuki; and Tunemoto, Daiei, 4,526,987, Cl. 549-305.000.
Lehman, Richard L.; and Manring, William H., 4,526,603, Cl. 65-136.000.

Focke & Co.: *See*—
Focke, Heinz, 4,526,360, Cl. 271-122.000.

Focke, Heinz, to Focke & Co. Process and apparatus for feeding bands to a pack. 4,526,360, Cl. 271-122.000.

Fogarty, Thomas J.: *See*—
Chin, Albert K.; and Kinney, Thomas B., 4,526,175, Cl. 128-344.000.

Fogerson, Richard D., to Ore-Ida Foods, Inc. Apparatus for processing potatoes. 4,526,093, Cl. 99-584.000.

Fogt, Kenneth E.; Slosser, James D.; Varos, John A.; and Radhakrishnan, Gopinath, to Pioneer Industrial Products Company. Protective apparel material and method for producing same. 4,526,828, Cl. 428-229.000.

Fonov, Sergei D.: *See*—
Bykov, Anatoly P.; Orlov, Anatoly A.; Gribanov, Dmitry D.; Kulesh, Vladimir P.; Fonov, Sergei D.; Egorov, Vitaly V.; Moskalik, Leonid M.; Martynov, Apollinary K.; and Ryadchikov, Vladimir E., 4,526,471, Cl. 356-373.000.

Forbush, Donald C.; and Seamon, Glen R., to International Environmental, Inc. Sulfurous acid generator. 4,526,771, Cl. 423-543.000.

Ford Motor Company: *See*—
Hideg, Laszlo; Koller, Paul L.; and Samson, Rogelio G., 4,526,152, Cl. 123-478.000.
Rosen, Stanley D.; and Ross, William D., 4,526,065, Cl. 74-869.000.
Watanabe, Shunso F., 4,526,060, Cl. 74-626.000.

Foreman, Robert J.: *See*—
Gerard, William A.; and Foreman, Robert J., 4,527,094, Cl. 315-39.550.

Formaini, Richard E., to Georgia-Pacific Resins, Inc. Urea-formaldehyde liquid fertilizer suspension. 4,526,606, Cl. 71-3.000.

Fort, Jacques, to Sapivog. Gripper for textile cloth or the like. 4,526,363, Cl. 271-268.000.

Foss, George D.: *See*—
Burguette, Mario D.; and Foss, George D., 4,526,833, Cl. 428-336.000.

Foster, John E. Blade opening scabbard for folding knife. 4,525,928, Cl. 30-158.000.

Foster Wheeler Energy Corporation: *See*—
Stewart, Robert D., 4,526,759, Cl. 422-143.000.

Fouletier, Mireille; Siebert, Elisabeth; and Le Moigne, Jacques, to Societe Nationale Elf Aquitaine. Oxygen gauge the working electrode of which is composed of a macrocyclic pyrolic compound. 4,526,674, Cl. 204-426.000.

Fox, Karl M.: *See*—
Burgess, Lester E.; Fox, Karl M.; and McGarry, Phillip E., 4,526,585, Cl. 44-51.000.

Foxboro Company, The: *See*—
Hallee, Donald O.; Lake, Harold; Johansson, Kenneth L.; and Graves, Thomas B., 4,527,271, Cl. 371-20.000.

Frank, Robert G.; Fecik, Michael T.; and Ewing, John J., to PPG Industries, Inc. Vacuum mold for shaping glass sheets. 4,526,605, Cl. 65-273.000.

Franklin, Cecil, to Simmonds Precision Products, Inc. Pre-calibrated fuel quantity capacitive probe. 4,526,027, Cl. 73-1.00H.

Franklin Sports Industries, Inc.: *See*—
Chong, Hae C., 4,525,877, Cl. 2-161.00A.

Fransson, Rolf G.: *See*—
Lundberg, Jan A.; and Fransson, Rolf G., 4,526,440, Cl. 350-257.000.

Frantz Medical Development Ltd.: *See*—
Bremer, Roger E.; Anthony, Charles, Jr.; and Chappel, Raymond M., 4,526,176, Cl. 128-641.000.

Franz, Leo J., to Leggett & Platt, Incorporated. Canopy for an upright display. 4,526,110, Cl. 108-108.000.

Frappe, Pierre: *See*—
Mutschler, Ulrich; Caparros, Pierre; Mouterde, Pierre; and Frappe, Pierre, 4,526,210, Cl. 139-59.000.

Frase, Dietmar; Eisenkolb, Roland; Kiener, Heinz; and Harant, Guter, to SKF Kugellagerfabriken GmbH. Sealed rolling element bearing. 4,526,485, Cl. 384-486.000.

Frater, Georg; Suchy, Milos; Wenger, Jean; and Winternitz, Paul, to Hoffmann-La Roche Inc. Phenoxy phenorey propionic hydrazides. 4,526,609, Cl. 71-118.000.

Fredin, Bo, to AB Asea-Atom. Fuel assembly having water passageway in channel wall. 4,526,746, Cl. 376-444.000.

French, Pierre B.; Antcliffe, David L.; and Donnellan, Gerald L., to Holset Engineering Company Limited. Exhaust brake valve. 4,526,004, Cl. 60-602.000.

Frentzel, Herman E., to Arneson Products, Inc. Low pressure pool cleaner. 4,526,186, Cl. 134-167.00R.

Fricker, Wolfgang-Peter; and Scholz, Manfred, to Kraftwerk Union Aktiengesellschaft. All-metallic heat insulation, formed of heat insulating building blocks which can be joined together. 4,525,968, Cl. 52-406.000.

Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., to Nanodata Computer Corporation. Data processing system. 4,527,237, Cl. 364-200.000.

Friedlaender, Fritz J.; Takayasu, Makoto; Hwang, Jiann-Yang; and Petrakis, Leon, to Purdue Research Foundation. Magnetic separation method utilizing a colloid of magnetic particles. 4,526,681, Cl. 209-214.000.

Frietsch, Kurt: *See—*
Maier, Peter; and Frietsch, Kurt, 4,526,261, Cl. 192-106.200.

Frodrich, Horst: *See—*
Kesselring, Lutz; and Frodrich, Horst, 4,526,274, Cl. 206-231.000.

Froehlich, Harold E., to Minnesota Mining and Manufacturing Company. Staple and cartridge for use in a tissue stapling device and a tissue closing method. 4,526,174, Cl. 128-335.000.

Froom, Thomas W., to Rendoll Paper Corporation. Folding ice-cream carton, carton blank and method. 4,526,563, Cl. 493-151.000.

Frost, John R.: *See—*
Glicksman, Martin; Frost, John R.; Silverman, Jerry E.; and Hegedus, Elizabeth, 4,526,799, Cl. 426-553.000.

Fuchs, Dieter; and Ruhland, Hans. Lip seal connected to stiffening ring by rubber-elastic layer. 4,526,383, Cl. 277-152.000.

Fuentes, Ricardo, Jr.; and Esneault, Calvin P., to Dow Chemical Company, The. Process for polymerizing olefins in the presence of a catalyst prepared from organomagnesium compound, organic hydroxyl-containing compound, reducing halide source and transition metal compound. 4,526,943, Cl. 526-133.000.

Fugleberg, Sigmund P.: *See—*
Blomquist, Seppo I.; Saarela, Markku T.; Pouru, Hannu J.; Nyman, Bror G.; Lindroos, Kaj-Henrik; Koivunen, Timo T.; and Fugleberg, Sigmund P., 4,526,650, Cl. 156-642.000.

Fuji Photo Film Co., Ltd.: *See—*
Horikawa, Kazuo; and Arakawa, Satoshi, 4,527,061, Cl. 250-327.200.
Ichijima, Seiji; and Hirose, Takeshi, 4,526,861, Cl. 430-385.000.
Idota, Yoshio, 4,526,857, Cl. 430-248.000.
Konishi, Masahiro, 4,527,205, Cl. 360-35.100.
Mihayashi, Keiji; Takada, Shunji; and Kobayashi, Hidetoshi, 4,526,863, Cl. 430-505.000.
Shirahata, Ryuji; Sekine, Masaru; and Akashi, Goro, 4,526,131, Cl. 118-718.000.
Suzuki, Toshiaki; and Horikawa, Kazuo, 4,527,060, Cl. 250-327.200.

Fuji Xerox Co., Ltd.: *See—*
Fuse, Mario, 4,527,007, Cl. 136-256.000.

Fujii, Etsuo: *See—*
Sato, Makoto; and Fujii, Etsuo, 4,526,426, Cl. 303-6.00C.

Fujii, Manabu: *See—*
Sato, Yasuo; Fukushima, Akio; Kaise, Toshiro; Honda, Yoshiyuki; Uemura, Kazuho; and Fujii, Manabu, 4,526,010, Cl. 62-126.000.

Fujii, Yasuhiko: *See—*
Owaki, Isao; Saito, Susumu; Fujii, Yasuhiko; and Nakamura, Shinji, 4,527,207, Cl. 360-73.000.

Fujimaki, Tatsuo: *See—*
Oshima, Noboru; Shimizu, Isamu; Yoshimura, Yoshito; Fujimaki, Tatsuo; and Tomita, Seisuke, 4,526,934, Cl. 525-332.900.

Fujimoto, Kazuhiro: *See—*
Oiso, Hisayoshi; Joyama, Norio; Fujimoto, Kazuhiro; and Okamoto, Kozo, 4,526,525, Cl. 425-9.000.

Fujimoto, Yasuyuki: *See—*
Anazawa, Shinzo; Yamada, Hitoshi; Noda, Kuniharu; and Fujimoto, Yasuyuki, 4,527,010, Cl. 174-52.0FP.

Fujioka, Atsushi; Miyadera, Yasuo; and Fukuda, Tomio, to Hitachi Chemical Company, Ltd. Polyamino-bis-imide resin. 4,526,838, Cl. 428-458.000.

Fujisawa, Noriyoshi; Ooshima, Katsuaki; Iijima, Junko; and Deguchi, Katsuhiko, to Kao Corporation. Liquid detergent composition. 4,526,710, Cl. 252-545.000.

Fujitsu Limited: *See—*
Hibi, Yasumori; and Matsuura, Hideo, 4,527,273, Cl. 371-38.000.
Higuchi, Mitsuo; and Yoshida, Masanobu, 4,527,077, Cl. 307-443.000.
Kiriseko, Tadashi, 4,525,922, Cl. 29-577.00C.
Matsui, Shougo; Mashima, Yoshimitu; and Kobayashi, Kenichi, 4,527,070, Cl. 250-560.000.
Sasaki, Nobuo, 4,527,181, Cl. 357-23.700.

Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, to Alps Electric Co., Ltd. Sheet pressing mechanism in a pen type recording device. 4,527,174, Cl. 346-136.000.

Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, to Alps Electric Co., Ltd. Multi-color pen recorder. 4,527,176, Cl. 346-141.000.

Fujiwara, Shigekazu: *See—*
Ooi, Kazushige; Fujiwara, Shigekazu; Yoshida, Nobuaki; and Mori, Yoshio, 4,527,189, Cl. 358-29.000.

Fujiyama, Yasutomo; and Kamiya, Osamu, to Canon Kabushiki Kaisha. Treatment device utilizing plasma. 4,526,644, Cl. 156-345.000.

Fujizoki Pharmaceutical Co., Ltd.: *See—*
Kido, Yasuji; Yoshida, Tsutomu; Hamakado, Toshinari; Anno, Masami; Harada, Takahiro; and Motoki, Yoshinobu, 4,526,866, Cl. 435-68.000.

Fukada, Hiroo, to Toso Kabushiki Kaisha. Curtain runner. 4,525,893, Cl. 16-102.000.

Fukaya, Chikara: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,526,969, Cl. 546-164.000.

Fukuda, Kozi; and Yamashita, Keitaro, to Hitachi Metals, Ltd. Developing apparatus. 4,526,130, Cl. 118-657.000.

Fukuda, Tomio: *See—*
Fujioka, Atsushi; Miyadera, Yasuo; and Fukuda, Tomio, 4,526,838, Cl. 428-458.000.

Fukuda, Yoshinori, to Ideya Co., Ltd. Holding apparatus for use in cleaner or dryer for dual pin type electronic parts. 4,526,185, Cl. 134-159.000.

Fukushima, Akio: *See—*
Sato, Yasuo; Fukushima, Akio; Kaise, Toshiro; Honda, Yoshiyuki; Uemura, Kazuho; and Fujii, Manabu, 4,526,010, Cl. 62-126.000.

Fuller, Dudley D.: *See—*
Stahl, Philip; Fuller, Dudley D.; and Rippel, Harry C., 4,526,484, Cl. 384-133.000.

Fulwyler, Mack J.: *See—*
Shoor, Bernard A.; and Fulwyler, Mack J., 4,526,276, Cl. 209-552.000.

Funakoshi, Satoshi: *See—*
Uemura, Yahiro; Arimura, Hirofumi; Morise, Hiroshi; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,526,782, Cl. 424-85.000.

Funk, James E., to Alfred University Research Foundation, Inc. Process for pumping a carbonaceous slurry. 4,526,584, Cl. 44-51.000.

Furda, John G. Game apparatus. 4,526,368, Cl. 273-14.000.

Furlong, Donn B., to Marine Construction & Design Co. Method and apparatus for unwrapping a plurality of short lines from a longline. 4,525,947, Cl. 43-4.000.

Furman, Burford J.: *See—*
Henderson, Jerald M.; and Furman, Burford J., 4,526,269, Cl. 198-443.000.

Furukawa, Osamu: *See—*
Kanai, Hideyuki; Furukawa, Osamu; Imai, Motomasa; and Takahashi, Takashi, 4,527,146, Cl. 338-20.000.

Furukawa, Toshihiko. Method for pattern controlled electrode movement for E.D.M. 4,527,036, Cl. 219-69.00M.

Furuya, Toshiaki: *See—*
Tsumuraya, Kenichi; and Furuya, Toshiaki, 4,526,489, Cl. 400-693.000.

Furuya, Yukitsuna: *See—*
Yasuda, Yutaka; Hirata, Yasuo; Murakami, Shuji; Nakamura, Katsuhiro; and Furuya, Yukitsuna, 4,527,279, Cl. 375-114.000.

Fuse, Mario, to Fuji Xerox Co., Ltd. Process for forming passivation film on photoelectric conversion device and the device produced thereby. 4,527,007, Cl. 136-256.000.

Futurdent Industries Inc.: *See—*
Prasad, Arun, 4,526,221, Cl. 164-289.000.

Fuwesi, Peter. Method and apparatus for inner lining metallic bearing lugs. 4,527,039, Cl. 219-76.140.

G-C Dental Industrial Corp.: *See—*
Ohi, Nobukazu; Ohno, Koji; and Tosaki, Satoshi, 4,526,619, Cl. 106-35.000.

G. W. Galloway Company, Inc.: *See—*
Galloway, James J.; and Blanchard, Albert E., 4,526,346, Cl. 254-122.000.

Gachegov, Ivan G., deceased: *See—*
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.

Gachegova, Lidia T., administrator: *See—*
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.

Gaide, Albert, to Mistral Windsurfing A.G. Mast base structure for a sailboard. 4,526,120, Cl. 114-39.000.

Gaiser, Mark D.: *See—*
EerNisse, Errol P.; Gaiser, Mark D.; Hanley, John P.; Kistler, Walter P.; Paros, Jerome M.; and Wiggins, Robert B., 4,526,247, Cl. 177-210.0FP.

Galdun, Daniel J.; Struger, Odo J.; Grants, Valdis; and Brown, Ronald A., to Allen-Bradley Company. Video computer terminal with detachable intelligent keyboard module. 4,527,250, Cl. 364-900.000.

Galena, Peter E.: *See—*
Hackett, Walter J.; and Galena, Peter E., 4,526,815, Cl. 427-355.000.

Gallagher, Timothy F.: *See—*
Durette, Philippe L.; and Gallagher, Timothy F., 4,526,999, Cl. 514-549.000.

Gallion, James A.; and Tomczak, Roman M., to Tipper Tie, Inc. Inverted tee cross section clip. 4,525,898, Cl. 24-30.50W.

Galloway, James J.; and Blanchard, Albert E., to G. W. Galloway Company, Inc. Self-contained elevating table. 4,526,346, Cl. 254-122.000.

Gang Nail Systems, Inc.: *See—*
Palacio, Joaquin J.; and Cristobal, Carlos C., 4,525,972, Cl. 52-643.000.

Gannon, John A.: *See—*
Seymour, John P.; and Gannon, John A., 4,526,940, Cl. 525-526.000.

Gantzer, Jean-Paul: *See—*
Werner, Anton; and Gantzer, Jean-Paul, 4,525,987, Cl. 56-15.200.

Gao Gesellschaft fur Automation und Organisation mbH: *See—*
Stenzel, Gerhard, 4,527,051, Cl. 235-380.000.

Gaquere, Jean-Pierre, to Societe Nationale Industrielle et Aerospatiale. Automatic mounting appliance for assembling means. 4,526,067, Cl. 81-55.000.

Garavuso, Gerald M., to Xerox Corporation. Dual jet bottom vacuum corrugation feeder. 4,526,359, Cl. 271-94.000.

Garde, John H.: *See*—
MacNamara, Barry A.; and Garde, John H., 4,526,264, Cl. 194-1.00N.
Garfinkle, Benjamin L., to Clamp Swing Pricing Co. Merchandise holder and display device. 4,526,335, Cl. 248-221.400.
Garkavy, Anatoly L.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.
Garrett Corporation, The: *See*—
Malcolm, Bruce, 4,526,262, Cl. 193-25.00B.
Garriga, Eliseo B. Anodizing method. 4,526,660, Cl. 204-58.000.
Garrison, Frank E.; and Harth, George H., III, to Babcock & Wilcox Company, The. Thermal sleeve for superheater nozzle to header connection. 4,526,137, Cl. 122-476.000.
Gartner, Karl, to Yoshida Kogyo K.K. Apparatus for connecting upper and lower curtain wall units in a unit type curtain wall. 4,525,962, Cl. 52-235.000.
Gartner, Karl, to Yoshida Kogyo K. K. Section for mounting a curtain wall. 4,525,963, Cl. 52-235.000.
Gartner, William J. Germicidal solutions effective for solid surface disinfection. 4,526,751, Cl. 422-37.000.
Garvey, Christopher M.: *See*—
Son, Adelina J.; Neal, Vernon S.; and Garvey, Christopher M., 4,526,693, Cl. 252-8.50B.
Gauthier, Robert V.: *See*—
Campbell, Gaylon S.; Tanner, Bertrand D.; and Gauthier, Robert V., 4,526,034, Cl. 73-336.500.
Gay, Charles H., Jr.; and Lenahan, Dean T., to General Electric Company. Rub tolerant shroud. 4,526,509, Cl. 415-174.000.
Gaynor, Ronald E. Voice synthesizer. 4,527,274, Cl. 381-51.000.
Gebhard, Georg R. U.; Hein, Klaus R. G.; and Glaser, Wolfgang, to Rheinisch-Westfallisches Elektrizitatswerk Aktiengesellschaft. Absorbent for the dry removal of sulfur dioxide and like components of an exhaust gas. 4,526,703, Cl. 252-189.000.
Geffcken, Walter; and Littwin, Burkhard, to Siemens Aktiengesellschaft. Flat color picture reproduction or video display device. 4,527,100, Cl. 315-366.000.
Geiler, Volkmar: *See*—
Grabowski geb. Marszalek, Danuta; Ross, Ludwig; Geiler, Volkmar; and Mennemann, Karl, 4,526,874, Cl. 501-77.000.
Geisel, Donald J.: *See*—
Rogers, David P.; and Geisel, Donald J., 4,527,119, Cl. 324-158.00F.
Geissmann, Felix: *See*—
Molnar, Istvan; Thiele, Kurt; Geissmann, Felix; and Jahn, Ulrich, 4,526,898, Cl. 514-392.000.
Geiszler, Willard A., Jr.: *See*—
Nichols, Walter A.; Newsome, Reginald W.; and Geiszler, Willard A., Jr., 4,526,183, Cl. 131-336.000.
General Audio-Visual Inc.: *See*—
Viasmensky, Vladimir, 4,526,337, Cl. 248-639.000.
General Electric Company: *See*—
Anthony, Thomas R.; Houston, Douglas E.; and Loughran, James A., 4,527,183, Cl. 357-30.000.
Auerbach, Abraham, 4,526,807, Cl. 427-53.100.
Axelrod, Robert J., 4,526,917, Cl. 524-141.000.
Cline, Harvey E., 4,527,082, Cl. 310-313.00B.
Dallavia, Anthony J., Jr., 4,526,953, Cl. 528-15.000.
Gay, Charles H., Jr.; and Lenahan, Dean T., 4,526,509, Cl. 415-174.000.
Guyton, Peter F.; and Lonn, Albert H. R., 4,527,057, Cl. 250-252.100.
Hodge, James D., 4,526,876, Cl. 501-128.000.
Hook, Richard B., 4,526,512, Cl. 416-96.00A.
Hsia, Edward S.; Emani, Raghuram J.; and Starkweather, John H., 4,526,226, Cl. 165-109.00R.
Jones, Donald W., 4,525,925, Cl. 29-598.000.
Laskaris, Evangelos T., 4,526,015, Cl. 62-514.00R.
Mark, Victor, 4,526,956, Cl. 528-176.000.
Owen, Daniel V., 4,527,098, Cl. 315-290.000.
Pelc, Norbert J., 4,526,862, Cl. 430-496.000.
Schmidt, George S., 4,526,345, Cl. 254-93.00R.
General Foods Corporation: *See*—
Altomare, Robert E.; Beale, Robert J.; Glicksman, Martin; Hegedus, Elizabeth; Schulman, Marvin; and Silverman, Jerry E., 4,526,794, Cl. 426-258.000.
Glicksman, Martin; Frost, John R.; Silverman, Jerry E.; and Hegedus, Elizabeth, 4,526,799, Cl. 426-553.000.
General Foundry Products Corporation: *See*—
Reiland, Dennis J., 4,526,338, Cl. 249-197.000.
General Motors Corporation: *See*—
Edwards, Ralph W., 4,527,168, Cl. 343-901.000.
Kade, Alexander, 4,527,103, Cl. 318-293.000.
Georg Fischer Aktiengesellschaft: *See*—
Helg, Hansrudolf, 4,526,222, Cl. 164-340.000.
Geo. A. Hormel & Company: *See*—
Leining, Lyndon R.; Bliese, Rodger W.; and White, Gordon G., 4,525,896, Cl. 17-1.00R.
Georgia-Pacific Resins, Inc.: *See*—
Formaini, Richard E., 4,526,606, Cl. 71-3.000.
Gerard, William A.; and Foreman, Robert J., to Varian Associates, Inc. Altitude compensation for frequency agile magnetron. 4,527,094, Cl. 315-39.550.
Gerni A/S: *See*—
Knudsen, Soren, 4,526,321, Cl. 239-229.000.
Getzin, Allan R., to Allis-Chalmers Corporation. Electrode rapping arrangement. 4,526,591, Cl. 55-112.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Becker, Kunibert; Elsner, Burckhardt; and Kirchbrucher, Rudiger, 4,526,495, Cl. 405-299.000.
Geyler, Arthur H., Jr.; and Teach, Ted L., to Spectra-Physics, Inc. Four-way valve with internal pilot. 4,526,201, Cl. 137-625.630.
Ghoneim, Salah. Waste gas collection device. 4,526,350, Cl. 266-159.000.
Giebel, Burkhard, to ITT Industries, Inc. Electrically erasable memory matrix (EEPROM). 4,527,256, Cl. 365-154.000.
Gilman, Robert F.; and Schwarz, Claude R., to Sentronic of California Incorporated. Improved method and apparatus for detecting and locating residually magnetized items. 4,527,123, Cl. 324-254.000.
Gilman, Sol: *See*—
Binder, Michael; Walker, Charles W., Jr.; Petersen, Eric R.; Wade, William L., Jr.; and Gilman, Sol, 4,526,881, Cl. 502-101.000.
Ginkel, Ernst R.: *See*—
Vincent, Arthur L; Robinson, James R.; and Ginkel, Ernst R., 4,526,755, Cl. 422-90.000.
Giobbio, Vincenzo; Ornato, Giorgio; Buracchi, Livio; and Mangia, Alberto, to Pierrel S.p.A. Process for the preparation of the anhydride of N-formyl-L-aspartic acid. 4,526,985, Cl. 549-253.000.
Gioffre, Anthony J., to Union Carbide Corporation. Powdered carpet treating compositions. 4,526,583, Cl. 8-137.000.
Gist, Alfred. Security device to prevent removal of sliding windows and doors. 4,526,412, Cl. 292-258.000.
Gitlestad, Svein E.: *See*—
Myhren, Jan; and Gitlestad, Svein E., 4,526,678, Cl. 209-2.000.
Glaser, Wolfgang: *See*—
Gebhard, Georg R. U.; Hein, Klaus R. G.; and Glaser, Wolfgang, 4,526,703, Cl. 252-189.000.
Glasgeratebau Hirschmann: *See*—
Hirschmann, Adolf M.; Kaser, Klaus; Rieker, Hans; Busch, Hans-Peter; Rathke, Willi; and Maul, Heinz P., 4,526,294, Cl. 222-47.000.
Glassman, Donald. Receptacle for articles or the like. 4,525,950, Cl. 47-41.00R.
Glattli, Hans-Heinrich: *See*—
Stoll, Kurt; and Glattli, Hans-Heinrich, 4,526,827, Cl. 428-137.000.
Glennon, Timothy F., to Sundstrand Corporation. Inverter control system for providing an easily filtered output. 4,527,226, Cl. 363-41.000.
Glicksman, Martin; Frost, John R.; Silverman, Jerry E.; and Hegedus, Elizabeth, to General Foods Corporation. Process for preparing a high quality, reduced-calorie cake. 4,526,799, Cl. 426-553.000.
Glicksman, Martin: *See*—
Altomare, Robert E.; Beale, Robert J.; Glicksman, Martin; Hegedus, Elizabeth; Schulman, Marvin; and Silverman, Jerry E., 4,526,794, Cl. 426-258.000.
Global Navigation, Inc.: *See*—
Nolte, David B., 4,527,197, Cl. 358-168.000.
Globol-Werk GmbH: *See*—
von Philipp, Fritz; and Schimanski, Georg, 4,526,320, Cl. 239-43.000.
Gnecchi and Company S.p.A.: *See*—
Offredi, Giovanni, 4,527,018, Cl. 179-146.00R.
Gnjidic, Branko: *See*—
Pavlovic, Pavao; and Gnjidic, Branko, 4,526,602, Cl. 65-81.000.
Goel, Anil B., to Ashland Oil, Inc. Manufacture of diacyloxy aromatic compounds. 4,526,722, Cl. 260-410.500.
Goetzinger, Charles J.: *See*—
Hickey, Robert V.; Hickey, Duane B.; and Goetzinger, Charles J., 4,526,463, Cl. 355-83.000.
Goff, Norman: *See*—
Hall, Howard H.; and Goff, Norman, 4,526,493, Cl. 404-105.000.
Goldberg, Marvin; and Brandon, Arthur, to Revlon, Inc. Hair care compositions. 4,526,781, Cl. 424-70.000.
Goldfarb, Adolph E.; and Everitt, Delmar K., to Goldfarb, Adolph E. Toy motorcycle and launcher apparatus. 4,526,554, Cl. 446-429.000.
Goldin, Reeni: *See*—
Nibby, Chester M., Jr.; Goldin, Reeni; and Andrews, Timothy A., 4,527,251, Cl. 364-900.000.
Goodall, James R.: *See*—
Bloomfield, Allen A.; and Goodall, James R., 4,526,326, Cl. 242-43.200.
Goodway Tools Corporation: *See*—
Grimsley, Arvid K., 4,526,297, Cl. 222-107.000.
Goodyear Tire & Rubber Company, The: *See*—
Burkley, Thomas E.; and Kifor, Harry T., 4,526,207, Cl. 138-93.000.
Castner, Kenneth F., 4,526,947, Cl. 526-240.000.
Deregibus, Alfio, 4,526,640, Cl. 156-242.000.
Harding, Antony; and Marthoz, Roger, 4,526,267, Cl. 198-409.000.
Kline, John W.; and Ward, Donald W., 4,526,528, Cl. 425-133.500.
Long, Barry W., 4,526,637, Cl. 156-137.000.
Portalupi, Steven J.; and Riggs, Robert S., 4,526,647, Cl. 156-406.400.
Goss, Joseph R.; and Schulz, David W., to Rockwell International Corporation. Low cost method of making superplastically formed and diffusion bonded structures. 4,526,312, Cl. 228-157.000.

Gotoh, Osamu: *See*—
Hasegawa, Shumpei; Gotoh, Osamu; and Otobe, Yutaka, 4,526,153, Cl. 123-480.000.

Gotou, Makoto, to Matsushita Electric Industrial Co., Ltd. Drive system for a DC motor with reduced power loss. 4,527,102, Cl. 318-254.000.

Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft: *See*—
Stehning, Werner, 4,526,764, Cl. 423-242.000.

Gottschalk, Ingo: *See*—
Brockmann, Sigismund; and Gottschalk, Ingo, 4,527,029, Cl. 200-148.00B.

Gould Inc.: *See*—
Tanielian, Minas; Blackstone, Scott; and Lajos, Robert, 4,526,665, Cl. 204-192.00C.

Goward, G. William: *See*—
Shankar, Srinivasan; and Goward, G. William, 4,526,814, Cl. 427-253.000.

Goward, Robert M.: *See*—
Fantone, Stephen D.; Goward, Robert M.; and Kaplan, Jonathan I., 4,526,444, Cl. 350-501.000.

Gowda, Hanumaiah L.: *See*—
Raj, Kuldip; and Gowda, Hanumaiah L., 4,526,380, Cl. 277-80.000.
Raj, Kuldip; and Gowda, Hanumaiah L., 4,526,382, Cl. 277-80.000.

Grabowski geb. Marszalek, Danuta; Ross, Ludwig; Geiler, Volkmar; and Mennemann, Karl, to Schott Glaswerke. Optical light weight glass with a refractive index of >1.70, an Abbe index of >22 and a density of <3.5 G/CM^3. 4,526,874, Cl. 501-77.000.

Graham, Merrill E., Jr.; and Blankenship, Ronnie L. Electro-hydraulic position control for a machine tool with actual and commanded position feedback. 4,527,244, Cl. 364-474.000.

Granday, Georges; and Jeandot, Marcel, to S.A. Presure Granday. Process of producing a coagulant composition for cheese production. 4,526,792, Cl. 426-56.000.

Grantham, LeRoy F.; and Ashworth, Joseph A., to Rockwell International Corporation. Removal of polyhalogenated biphenyls from organic liquids. 4,526,677, Cl. 208-262.000.

Grants, Valdis: *See*—
Galdun, Daniel J.; Struger, Odo J.; Grants, Valdis; and Brown, Ronald A., 4,527,250, Cl. 364-900.000.

GRAPHA-Holding AG: *See*—
Thierstein, Hans, 4,526,362, Cl. 271-186.000.

Graphic Resources, Inc.: *See*—
Hattemer, James C., 4,526,405, Cl. 283-81.000.

Grasselli, Robert K.: *See*—
Tsou, Dean T.; Burrington, James D.; Maher, Elizabeth A.; and Grasselli, Robert K., 4,526,884, Cl. 502-154.000.

Grava, Arturs, to Lubrizol Corporation, The. Method for preparing interpolymers. 4,526,950, Cl. 526-272.000.

Graves, Thomas B.: *See*—
Hallee, Donald O.; Lake, Harold; Johansson, Kenneth L.; and Graves, Thomas B., 4,527,271, Cl. 371-20.000.

Great Lakes Carbon Corporation: *See*—
Joo , Louis A.; Tucker, Kenneth W.; and Webb, Scott D., 4,526,669, Cl. 204-243.00R.

Green Cross Corporation, The: *See*—
Uemura, Yahiro; Arimura, Hirofumi; Morise, Hiroshi; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,526,782, Cl. 424-85.000.
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,526,969, Cl. 546-164.000.

Green, Jerrold D.: *See*—
La Barge, Robert L.; Scherf, Thomas W.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Pohlenz, Elmer E., 4,526,096, Cl. 100-53.000.

Greenblatt, Abraham J.; and Kim, Joon S. Adjustable powered nutcracker. 4,526,092, Cl. 99-575.000.

Gregor, Heinz-Dieter: *See*—
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, 4,527,066, Cl. 250-507.100.
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, 4,527,067, Cl. 250-507.100.
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, 4,527,068, Cl. 250-507.100.

Greigger, Paul P.: *See*—
Das, Suryya K.; Greigger, Paul P.; Boberski, William G.; Jones, James E.; Schappert, Raymond F.; and Seiner, Jerome A., 4,526,910, Cl. 523-220.000.

Greiner Instruments AG: *See*—
Oberli, Rudolf, 4,526,046, Cl. 73-864.160.

Grey, Seymour: *See*—
Parr, Richard S.; Ramachandran, Pallassana N.; Grey, Seymour; and Reinish, Martin D., 4,526,702, Cl. 252-174.250.

Gribanov, Dmitry D.: *See*—
Bykov, Anatoly P.; Orlov, Anatoly A.; Gribanov, Dmitry D.; Kulesh, Vladimir P.; Fonov, Sergei D.; Egorov, Vitaly V.; Moskalik, Leonid M.; Martynov, Apollinary K.; and Ryadchikov, Vladimir E., 4,526,471, Cl. 356-373.000.

Gries, Heinz: *See*—
Niedballa, Ulrich; and Gries, Heinz, 4,526,994, Cl. 549-451.000.

Grigorieva, Elizaveta A.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.

Grigsby, Robert A., Jr.: *See*—
Speranza, George P.; and Grigsby, Robert A., Jr., 4,526,972, Cl. 546-191.000.

Grimsley, Arvid K., to Goodway Tools Corporation. Collapsible laminated tube container and method for making it. 4,526,297, Cl. 222-107.000.

Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., to Merrell Dow Pharmaceuticals Inc. [1,2-Dihydro-4(5)-acyl-2-oxo-2H-imidazol-4(5)-yl] methyl nitrates. 4,526,981, Cl. 548-321.000.

Grittmann, Ernst-Juergen; Weis, Hans-Joachim; and Manzke, Klaus, to BASF Aktiengesellschaft. Device for positioning a scanning head in a drive unit for disk records. 4,527,211, Cl. 360-109.000.

Grob, Ferdinand, to Robert Bosch GmbH. Apparatus for controlling the air-fuel ratio of an internal combustion engine. 4,526,147, Cl. 123-440.000.

Grobman, William, to Molins Machine Company, Inc. Ink circulation and wash up system for a press. 4,526,102, Cl. 101-425.000.

Groeger, Heinz K.: *See*—
Malthouse, Martin D.; and Groeger, Heinz K., 4,526,645, Cl. 156-350.000.

Groeneveld, Marinus: *See*—
van der Voort, Gabriel N. M. M.; and Groeneveld, Marinus, 4,526,849, Cl. 430-57.000.

Grove, Richard W.: *See*—
Bryan, Larry E.; Grove, Richard W.; and Primus, William F., 4,525,914, Cl. 29-402.080.

GTE Automatic Electric Inc.: *See*—
Krikor, Krikor A., 4,527,157, Cl. 340-825.010.

GTE Business Communication Systems Inc.: *See*—
Sublette, John D., 4,527,016, Cl. 179-90.00B.

GTE Products Corporation: *See*—
Bouchard, Andre C.; Maya, Jakob; Loughridge, Fred; Andress, Charles W.; and Wierzbicki, Julian, 4,527,088, Cl. 313-493.000.
Bouchard, Andre C.; and Maya, Jakob, 4,527,089, Cl. 313-493.000.
Jerabek, Charles F., 4,526,840, Cl. 428-596.000.
Maya, Jakob, 4,527,086, Cl. 313-485.000.

Guarnieri, Joseph J.: *See*—
McKelvey, Thomas E.; and Guarnieri, Joseph J., 4,527,005, Cl. 136-221.000.

Guenthner, Russell W.: *See*—
Ryan, Charles P.; Guenthner, Russell W.; and Trubisky, Leonard G., 4,527,238, Cl. 364-200.000.

Guerout, Jean B.; and Urbin, Jack, to AMP Incorporated. Method and apparatus for connecting an insulating housing of a connector and a cover. 4,525,927, Cl. 29-861.000.

Guerrero, Benjamin G., to Mattel, Inc. Floppy limbed water immersible figure toy. 4,526,553, Cl. 446-380.000.

Guerret, Patrick G.: *See*—
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,526,786, Cl. 514-240.000.

Guesdon, Jean-Luc: *See*—
Avrameas, Stratis; and Guesdon, Jean-Luc, 4,526,871, Cl. 436-504.000.

Gulf Oil Corporation: *See*—
Dickerson, Richard C., 4,526,229, Cl. 166-120.000.

Guntert, Josef; Hafele, Walter; Pfeifle, Helmut; Schwartz, Reinhard; and Straubel, Max, to Robert Bosch GmbH. Fuel injection apparatus for internal combustion engines. 4,526,150, Cl. 123-447.000.

Gupta, Ashok K.; Gyarmati, Erno ; Munzer, Rudolf; and Naoumidis, Aristides, to Kernforschungsanlage Julich GmbH. Method of molding bonded parts with silicon carbide surfaces. 4,526,649, Cl. 156-629.000.

Gupta, Mool C.; Wrobel, Joseph J.; and Strome, Forrest C., Jr., to Eastman Kodak Company. Erasable, reusable optical recording element and method. 4,527,173, Cl. 346-135.100.

Gupta, Ramesh, to Exxon Research and Engineering Co. Pulsed flow vapor-liquid reactor. 4,526,757, Cl. 422-106.000.

Gusrud, Svein A.: *See*—
Mengshoel, Hans C.; and Gusrud, Svein A., 4,526,422, Cl. 297-243.000.

Guterman, Daniel C., to Mostek Corporation. E^2PROM having bulk storage. 4,527,258, Cl. 365-185.000.

Gutierrez, Richard: *See*—
Kay, Edward L.; and Gutierrez, Richard, 4,526,959, Cl. 528-930.000.

Gutleber, Frank S., to United States of America, Army. Digital pulse position modulation communications system with threshold extension. 4,527,276, Cl. 375-23.000.

Guyton, Peter F.; and Lonn, Albert H. R., to General Electric Company. Test body arrangement. 4,527,057, Cl. 250-252.100.

GVT Gesellschaft fur Verfahrenstechnik der garnverarbeitenden Industrie mbH: *See*—
Mannel, Friedrich, 4,526,116, Cl. 112-266.100.

Gyarmati, Erno : *See*—
Gupta, Ashok K.; Gyarmati, Erno ; Munzer, Rudolf; and Naoumidis, Aristides, 4,526,649, Cl. 156-629.000.

H. H. H. Concrete Paving Co.: *See*—
Hall, Howard H.; and Goff, Norman, 4,526,493, Cl. 404-105.000.

H. R. Electronics Company: *See*—
Levasseur, Joseph L., 4,526,263, Cl. 194-1.00N.

Ha, Truong M.: *See*—
Bargiel, Douglas A.; Assony, Edward M.; Ha, Truong M.; and Rosseau, Richard B., 4,525,888, Cl. 15-83.000.

Haard, Norman F.: *See—*
Shasuzzaman, Kazi M.; and Haard, Norman F., 4,526,868, Cl. 435-226.000.

Haas, Michael F. Ornamental marker for vehicle antennas. 4,526,820, Cl. 428-31.000.

Haas, Udo: *See—*
Koger, Friedrich; and Haas, Udo, 4,526,506, Cl. 415-98.000.

Hackett, Walter J.; and Galena, Peter E., to TP Industrial, Inc. Floor polishes particularly receptive to high speed and very high speed spray or dry buffing. 4,526,815, Cl. 427-355.000.

Hafele, Walter; Pfeifle, Helmut; Schwartz, Reinhard; and Straubel, Max, to Robert Bosch GmbH. Fuel injection apparatus for internal combustion engines. 4,526,149, Cl. 123-447.000.

Hafele, Walter: *See—*
Guntert, Josef; Hafele, Walter; Pfeifle, Helmut; Schwartz, Reinhard; and Straubel, Max, 4,526,150, Cl. 123-447.000.

Hagimori, Kenji: *See—*
Yoshizawa, Akinori; Nakane, Yasuo; Hagimori, Kenji; Ohgai, Koya; Arisawa, Norisada; Takahashi, Tadashi; Maekawara, Hideaki; Imaizumi, Hiroyuki; Tsuchida, Hideyuki; Mieno, Eiichirou; and Sugino, Kenji, 4,526,611, Cl. 75-0.50B.

Hahn, Granville J.: *See—*
Searl, Alonzo H.; Hahn, Granville J.; and Rutledge, Raleigh N., 4,526,736, Cl. 264-53.000.

Hajj, John G., to LFE Corporation. Automatically loadable multifaceted electrode with load lock mechanism. 4,526,670, Cl. 204-298.000.

Hale, Richard A.; Olsson, Nils O.; and Reiff, Thomas F., to J. I. Case Company. Turn-over seal. 4,526,377, Cl. 277-9.000.

Hall, Henry K.; and Wilson, Donald R., to Celanese Corporation. Acrylate and methacrylate monoesters of pentaerythritol and pentaerythritol orthoesters and polymers and copolymers derived therefrom. 4,526,949, Cl. 526-268.000.

Hall, Howard H.; and Goff, Norman, to H. H. H. Concrete Paving Co. Slip-forming machine and process for laying concrete mix adjacent to plastic concrete mix. 4,526,493, Cl. 404-105.000.

Hall, Robert B.; and Rocheleau, Richard E., to University of Delaware. Process and apparatus for formation of photovoltaic compounds. 4,526,809, Cl. 427-74.000.

Hall, Steven E.; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted oxa prostaglandin analogs and their use in the treatment of thrombolytic disease. 4,526,900, Cl. 514-469.000.

Hallcher, Richard C.: *See—*
Coleman, James P.; Hallcher, Richard C.; Rogers, Thomas E.; and McMackins, Dudley E., 4,526,990, Cl. 549-326.000.

Hallee, Donald O.; Lake, Harold; Johansson, Kenneth L.; and Graves, Thomas B., to Foxboro Company, The. Process control system with improved fault isolation. 4,527,271, Cl. 371-20.000.

Halliburton Company: *See—*
Smith, Harry D., Jr., 4,527,058, Cl. 250-256.000.
Son, Adelina J.; Neal, Vernon S.; and Garvey, Christopher M., 4,526,693, Cl. 252-8.50B.

Halliday, Mary M.: *See—*
Hobbs, James W.; and Halliday, Mary M., 4,526,657, Cl. 203-3.000.

Hamad, Ahmed M.: *See—*
Sorba, Antoine; Attal, Gerard J.; Seignier, Georges B.; and Hamad, Ahmed M., 4,527,116, Cl. 324-77.00B.

Hamakado, Toshinari: *See—*
Kido, Yasuji; Yoshida, Tsutomu; Hamakado, Toshinari; Anno, Masami; Harada, Takahiro; and Motoki, Yoshinobu, 4,526,866, Cl. 435-68.000.

Hambrecht, Juergen; Brandstetter, Franz; Ziegler, Walter; Muller, Wolfgang F.; Bronstert, Klaus; and Echte, Adolf, to BASF Aktiengesellschaft. Thermoplastic molding materials. 4,526,927, Cl. 525-68.000.

Hamersley, Richard A.: *See—*
Bogan, Leonard E.; and Hamersley, Richard A., 4,527,266, Cl. 370-58.000.

Hammar, Walton J.: *See—*
Scherrer, Robert A.; Stern, Richard M.; and Hammar, Walton J., 4,526,896, Cl. 514-252.000.

Hamra, Victor W.: *See—*
Cronin, Michael J.; and Hamra, Victor W., 4,526,432, Cl. 339-75.00M.

Hanamura, Yoshihiko: *See—*
Suzuki, Toru; Sano, Eiichi; and Hanamura, Yoshihiko, 4,526,450, Cl. 351-206.000.

Hanley, John P.: *See—*
EerNisse, Errol P.; Gaiser, Mark D.; Hanley, John P.; Kistler, Walter P.; Paros, Jerome M.; and Wiggins, Robert B., 4,526,247, Cl. 177-210.0FP.

Hanma, Noritaka: *See—*
Saji, Ikutaro; Sato, Renzo; Hanma, Noritaka; and Motoike, Yasuo, 4,526,983, Cl. 548-341.000.

Hannerz, Kare, to AB Asea-Atom. Nuclear reactor plant. 4,526,742, Cl. 376-282.000.

Hansen, Helge, to Thermoform A/S. Double-glazed window for insertion in openings in walls or doors of a sandwich-type construction. 4,525,961, Cl. 52-208.000.

Hansen, Jorgen, to Elmwood Sensors Limited. Engine temperature sensor. 4,526,481, Cl. 374-144.000.

Hansen, Loren F., to Outboard Marine Corporation. Drive coupling assembly. 4,526,555, Cl. 464-149.000.

Hanson, George N., to Eastern Safety Equipment Co., Inc. Visitor spectacles. 4,526,448, Cl. 351-153.000.

Hansson, Per E. A.: *See—*
Jachimowicz, Felek; and Hansson, Per E. A., 4,526,936, Cl. 525-379.000.

Haque, Reza; Smith, Edward F., III; and Kadija, Igor V., to Olin Corporation. One-step plasma treatment of copper foils to increase their laminate adhesion. 4,526,806, Cl. 427-41.000.

Hara, Seinosuke; Aoyama, Shunichi; and Miisho, Kazuyuki, to Nissan Motor Company, Limited. Variable valve timing arrangement for an internal combustion engine or the like. 4,526,142, Cl. 123-90.160.

Harada, Takahiro: *See—*
Kido, Yasuji; Yoshida, Tsutomu; Hamakado, Toshinari; Anno, Masami; Harada, Takahiro; and Motoki, Yoshinobu, 4,526,866, Cl. 435-68.000.

Harada, Takakiyo: *See—*
Chiba, Hiromasa; Harada, Takakiyo; Kumahara, Katsumi; Kawazoe, Shunji; and Sato, Akihiro, 4,526,931, Cl. 525-268.000.

Harant, Guter: *See—*
Frase, Dietmar; Eisenkolb, Roland; Kiener, Heinz; and Harant, Guter, 4,526,485, Cl. 384-486.000.

Harding, Antony; and Marthoz, Roger, to Goodyear Tire & Rubber Company, The. Method and apparatus for storing and transferring tires to a hook conveyor. 4,526,267, Cl. 198-409.000.

Hardy, Terence: *See—*
Litchfield, Leon G.; and Hardy, Terence, 4,525,966, Cl. 52-397.000.

Hardy, Wayne R. Telephone answering system. 4,527,013, Cl. 179-27.0FH.

Harkless, Lloyd B.; McCracken, William L.; and Colosimo, Joseph A., to Honeywell Inc. Apparatus for selectively viewing either of two scenes of interest. 4,527,055, Cl. 250-234.000.

Harlan, Dale. Combine planter implement. 4,525,988, Cl. 56-16.800.

Harnisch, Horst: *See—*
Arndt, Frank; Claussen, Uwe; Harnisch, Horst; and Schellhammer, Carl-Wolfgang, 4,526,705, Cl. 252-301.320.

Harris, Carl N. Athletic timer. 4,526,479, Cl. 368-284.000.

Harrison, William J.; Reynolds, Andrew J.; Kellaway, Michael J.; MacMichael, Donald B. A.; and Miller, Anne T. Apparatus for forming mixtures of fluids. 4,526,215, Cl. 141-83.000.

Harrod, Christopher G. C., to Dentsply Research & Development Corp. Syringes. 4,526,303, Cl. 222-386.500.

Harth, George H., III: *See—*
Garrison, Frank E.; and Harth, George H., III, 4,526,137, Cl. 122-476.000.

Hartley, Joseph H., to United States of America, Army. Evanescent resonator frequency multiplier. 4,527,137, Cl. 333-137.000.

Hartman, Cedric. Lamp and support therefor. 4,527,225, Cl. 362-294.000.

Hartmann, Kurt: *See—*
Bohg, Armin; Hartmann, Kurt; and Matthaei, Horst, 4,527,139, Cl. 335-256.000.

Hartwall, John, to 501 KY K. Hartwall KB. Fender hoider. 4,526,124, Cl. 114-219.000.

Hartwig, Peter; Weppner, Werner; and Wichelhaus, Winfried, to Max-Planck-Gesellschaft Zur Foerderung Der Wissenschaften e.V. Process for the production of thermodynamically stable solid ion conductor materials. 4,526,855, Cl. 429-191.000.

Harvey, Kenneth; and Connors, Stephen T., to Colgate-Palmolive Company. Stable dentifrice containing neutral siliceouse polishing agent. 4,526,778, Cl. 424-52.000.

Has, Peter V.; and Lammers, Arend J. W., to Hazemeijer B.V. Device for moving an element between two end positions by means of an energy buffer. 4,527,026, Cl. 200-78.000.

Hasegawa, Akira: *See—*
Kishida, Kazuo; Hasegawa, Akira; Kawachi, Yasunori; Kawasaki, Hiroshi; and Mizukoshi, Hiroshi, 4,526,929, Cl. 525-80.000.

Hasegawa, Shumpei; and Makino, Yuzi, to Honda Giken Kogyo K.K. Idling rpm feedback control method for internal combustion engines. 4,526,144, Cl. 123-339.000.

Hasegawa, Shumpei; Gotoh, Osamu; and Otobe, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio control method for an internal combustion engine for vehicles in low load operating regions. 4,526,153, Cl. 123-480.000.

Hashimoto, Akira, to Sunstar Kabushi Kaisha. Topical skin depigmenting composition. 4,526,779, Cl. 424-62.000.

Hashimoto, Yoshihiro: *See—*
Iwata, Hitoshi; Hashimoto, Yoshihiro; and Yamada, Katsuhiko, 4,526,627, Cl. 148-12.00B.

Hashiura, Masayoshi; Okazaki, Akiyasu; and Suzuki, Sigeru, to Hitachi, Ltd. Laser machining system. 4,527,043, Cl. 219-121.0LQ.

Haslanger, Martin F.: *See—*
Hall, Steven E.; and Haslanger, Martin F., 4,526,900, Cl. 514-469.000.

Hasler Freres International S.A.: *See—*
Chauveau, Jean-Marie, 4,526,244, Cl. 177-1.000.

Hass, Martin A. Functional dental-balancing method and apparatus. 4,526,543, Cl. 433-214.000.

Hassall, Cedric H.: *See—*
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,526,960, Cl. 536-6.400.

Hassler, Dieter; Kresse, Heinz; Reichenberger, Helmut; and Naser, Georg, to Siemens Aktiengesellschaft. Apparatus for destroying calculi in body cavities. 4,526,168, Cl. 128-303.00R.

Haston, James E.; and Orloff, Anthony D. Portable basketball goal. 4,526,367, Cl. 273-1.50R.

Hatchadoorian, Edward; Ostapchenko, George J.; Patton, James L.; and Young, Harlan S. Process for thermoforming reinforced polymer sheets. 4,526,831, Cl. 428-287.000.

Hatfield, Jim J. Automatic jaw control for reversible power tool. 4,526,497, Cl. 408-240.000.

Hatfield, W. Robert: *See*—
Beshty, Bahjat S.; Hatfield, W. Robert; Lee, Hyo C.; Heck, Ronald M.; and Hsiung, Thomas H., 4,526,614, Cl. 75-83.000.

Haitemer, James C., to Graphic Resources, Inc. Label structure. 4,526,405, Cl. 283-81.000.

Hattori, Motonobu; Ishibashi, Akira; Ishida, Hiromi; and Nandoh, Kenji, to Hitachi, Ltd. Power inverter with overload protection apparatus. 4,527,214, Cl. 361-96.000.

Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. V-belt transmission apparatus. 4,526,561, Cl. 474-242.000.

Hauck, Gunther. Flux drying apparatus and method. 4,525,936, Cl. 34-33.000.

Hauni-Werke Korber & Co. KG.: *See*—
Hoffmann, Gottfried; Deutsch, Reinhard; and Pohl, Klaus-Jurgen, 4,526,268, Cl. 198-419.000.

Haussmann, Wolfgang; and Luder, Rainer, to Siemens Aktiengesellschaft. Method and apparatus for the digital control of the phase of the system clock of a digital signal processing system. 4,527,145, Cl. 358-19.000.

Hawkins, Ronald G.; and Hooker, Robert M., to Aluminum Company of America. Vibration damper for overhead conductor. 4,527,008, Cl. 174-42.000.

Hawkins, Ronald G., to Aluminum Company of America. Vibration damper with motion limiting feature. 4,527,009, Cl. 174-42.000.

Hawkins, Ronald G.: *See*—
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Haworth, Robert F., to RCA Corporation. Repeater for fiber optic bus distribution system. 4,527,286, Cl. 455-601.000.

Hayase, Masao; and Araki, Yozo, to Mitsubishi Jukogyo Kabushiki Kaisha; and House Food Industrial Co., Ltd. Sterilizing system for filled and sealed articles. 4,525,978, Cl. 53-167.000.

Hayashi, Hisao: *See*—
Ito, Koji; Onishi, Masanori; and Hayashi, Hisao, 4,527,283, Cl. 382-9.000.

Haytayan, Harry M., to Pneutek, Inc. Method and means for attaching insulation to a mold. 4,525,902, Cl. 24-350.000.

Hazeltine Corporation: *See*—
St. John, Karl M.; and Zagardo, Dominic V., 4,527,193, Cl. 358-76.000.

Hazemeijer B.V.: *See*—
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Heat Exchanger Industries, Inc.: *See*—
Warner, Donald F., 4,526,112, Cl. 110-345.000.

Heat-Timer Corporation: *See*—
Masson, Vijay, 4,527,246, Cl. 364-505.000.

Hebert, Francis A., to South Louisiana Contractors Inc. Board road bundle cradle. 4,526,278, Cl. 212-242.000.

Heck, Ronald M.: *See*—
Beshty, Bahjat S.; Hatfield, W. Robert; Lee, Hyo C.; Heck, Ronald M.; and Hsiung, Thomas H., 4,526,614, Cl. 75-83.000.

Hegedus, Elizabeth: *See*—
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Heidelberger Druckmaschinen AG: *See*—
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Heidjann, Franz; and Dammann, Johannes, to Claas Ohg. Self-propelled harvester thresher. 4,526,181, Cl. 130-27.00R.

Heiker, Fred R.; Muller, Lutz; Puls, Walter; and Bischoff, Hilmar, to Bayer Aktiengesellschaft. Amino-cyclitol derivatives and medicaments containing them. 4,526,784, Cl. 514-25.000.

Heimbuch, Alvin H.: *See*—
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Heinrich, Juergen; Schelter, Heinrich; Schindler, Stefan; and Krauth, Axel, to Hoechst CeramTec Ag. Process for manufacturing heat exchangers from ceramic sheets. 4,526,635, Cl. 156-89.000.

Heitmann, Arnold M., to Northern Research & Engineering Corp. Valve for throttling fluid. 4,526,199, Cl. 137-625.310.

Held, Kurt. Method of making molded articles. 4,526,737, Cl. 264-112.000.

Helg, Hansrudolf, to Georg Fischer Aktiengesellschaft. Low pressure casting method and apparatus. 4,526,222, Cl. 164-340.000.

Helm Instrument Company, Inc.: *See*—
Moser, Robert L.; and Wilhelm, Donald F., 4,526,044, Cl. 73-862.060.
Nawrocki, Nicholas F.; and Dodson, Matt R., 4,527,156, Cl. 340-753.000.

Helstrom, John J.: *See*—
Mahoney, John A.; Pellet, Regis J.; and Helstrom, John J., 4,526,675, Cl. 208-10.000.

Henderson, E. Webb. Particulating materials. 4,526,731, Cl. 264-5.000.

Henderson, James K. Pump. 4,526,520, Cl. 417-559.000.

Henderson, Jerald M.; and Furman, Burford J., to University of California, The Regents of the. Singulator. 4,526,269, Cl. 198-443.000.

Hendrick, Clifford L.: *See*—
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Henkel Corporation: *See*—
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Henkel Kommanditgesellschaft (Henkel KGaA): *See*—
Puchta, Rolf; Nusslein, Hans; Boeck, Alexander; and Streschnak, Benno, 4,526,694, Cl. 252-8.800.

Hennessey, Richard G.; Beemer, Richard B.; and Melles, Harold W., to J. I. Case Company. Fluid drive transmission employing lockup clutch. 4,526,255, Cl. 192-3.580.

Hennink, Wilhelmus E.: *See*—
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Hensley, Charles A.; and Kitko, David J., to Procter & Gamble Company, The. Hypochlorite bleach compositions containing optical brighteners. 4,526,700, Cl. 252-102.000.

Herbert, James F., to Metal Closures Limited. Plastic closure with sealing fin. 4,526,284, Cl. 215-329.000.

Herbert Kannegiesser GmbH & Co.: *See*—
Stuhmeier, Gunter; and Holzinger, Karl, 4,525,935, Cl. 34-14.000.

Herdeg, Karl: *See*—
Muller, Anton; Konig, Hubert; and Herdeg, Karl, 4,525,900, Cl. 24-68.0CT.

Herman, Charles A. Engine speed control circuit for emergency vehicle. 4,527,112, Cl. 320-61.000.

Herman, Herbert; and Marantz, Daniel R., to Surface Science Corp. Process for thermally spraying porous metal coatings on substrates. 4,526,839, Cl. 428-550.000.

Hermans, Mathias L.: *See*—
van der Sluys, Willem L. N.; and Hermans, Mathias L., 4,526,009, Cl. 62-101.000.

Herold, Barry W.; and Davis, Walter L., to Motorola, Inc. Oscillating circuit exhibiting tolerance to crystal impedance variations. 4,527,131, Cl. 331-116.0FE.

Herr, James E., to Kerr Glass Manufacturing Corporation. Moisture tight closure and container. 4,526,281, Cl. 215-211.000.

Herren, Thomas W., Jr. Firing mechanism for projectiles. 4,526,105, Cl. 102-498.000.

Herring, Robert W. Lamp circuit apparatus. 4,527,095, Cl. 315-65.000.

Herrmann, Heinz; and Schlosser, Hans-Joachim, to Hoechst Aktiengesellschaft. Liquid developer for developing electrostatic charge images and process for its preparation. 4,526,852, Cl. 430-115.000.

Hertel, Larry W., to Eli Lilly and Company. Difluoro antivirals and intermediate therefor. 4,526,988, Cl. 549-313.000.

Hess, Dieter; and Langenbacher, Helmut, to Werner & Pfleiderer. Method and apparatus for drying moisture-laden powder-like products, particularly of starches and flours. 4,525,934, Cl. 34-10.000.

Hettich, Gerhard: *See*—
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Hibi, Yasumori; and Matsuura, Hideo, to Fujitsu Limited. Magnetic disc device. 4,527,273, Cl. 371-38.000.

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Hickey, Robert V.; Hickey, Duane B.; and Goetzinger, Charles J., to CH_2M Hill, Inc. Apparatus for exposing photosensitive media. 4,526,463, Cl. 355-83.000.

Hideg, Laszlo; Koller, Paul L.; and Samson, Rogelio G., to Ford Motor Company. Low pressure low cost automotive type fuel injection system. 4,526,152, Cl. 123-478.000.

Higginbotham, John A., to Jope Manufacturing Co. Inc. Hydrotherapy system for tubs, spas or pools. 4,525,881, Cl. 4-496.000.

Higgs, Leonard: *See*—
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Higuchi, Mitsuo; and Yoshida, Masanobu, to Fujitsu Limited. Output circuit of a semiconductor device. 4,527,077, Cl. 307-443.000.

Hillerich, Bernd, to Philips Kommunikations Industrie AG. Method for measuring impulse delays and fault locations in cables and light wave conductors. 4,527,113, Cl. 324-52.000.

Hiraiwa, Kazuyoshi, to Nissan Motor Company, Ltd. Synchromesh mechanism for transmission. 4,526,052, Cl. 74-339.000.

Hirano, Chikafusa: *See*—
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Hirano, Mikio; and Horiuchi, Susumu, to Hitachi, Ltd. Process for treating radioactive waste. 4,526,712, Cl. 252-632.000.

Hirano, Yasutaka, to Mitsubishi Denki Kabushiki Kaisha. Elevator hoist unit. 4,526,252, Cl. 187-20.000.

Hiraoka, Takeshi; Urano, Shigeru; Takeshita, Masajiro; and Nakamura, Keiji, to Nippon Piston Ring Co., Ltd. Wear resistant ferro-based sintered alloy. 4,526,617, Cl. 75-236.000.

Hirata, Yasuo: *See*—
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Hirschmann, Adolf M.; Kaser, Klaus; Rieker, Hans; Busch, Hans-Peter; Rathke, Willi; and Maul, Heinz P., to Glasgeratebau Hirschmann. Dispenser for dispensing liquids in controlled quantities from a bottle. 4,526,294, Cl. 222-47.000.
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Hitachi Chemical Company, Ltd.: *See*—
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Hitachi Denshi Kabushiki Kaisha Corp.: *See*—
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Hochstrasser, Jurgen: *See*—
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Hoffman, Joseph H.; and Thayer, Steven R. Double-walled centrifugal fan scroll and system of operation. 4,526,510, Cl. 415-175.000.
Hoffmann, Gottfried; Deutsch, Reinhard; and Pohl, Klaus-Jurgen, to Hauni-Werke Korber & Co. KG. Apparatus for assembling arrays of cigarettes or the like. 4,526,268, Cl. 198-419.000.
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Hogan, Robert V. Multiple stroke shear. 4,526,076, Cl. 83-554.000.
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Holtz, Gilbert J. Cart support for a computer printout. 4,526,399, Cl. 280-655.000.
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Ryan, Charles P.; Guenthner, Russell W.; and Trubisky, Leonard G., 4,527,238, Cl. 364-200.000.
Honma, Masahiro; and Inokuchi, Iwane, to Nissan Motor Company, Limited. Fuel injection quantity adjustment apparatus for fuel injection pump. 4,526,145, Cl. 123-357.000.
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Hope, Henry F.; Hope, Stephen F.; and Fidelman, David, to Hope Industries, Inc. Color printing control system and method. 4,526,462, Cl. 355-38.000.
Hope Industries, Inc.: *See*—
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Hope, Stephen F.: *See*—
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Hornady Manufacturing Co.: *See*—
David, Donald M.; and Morris, Gene R., 4,526,084, Cl. 86-38.000.
Hornbaker, Edwin D.; and Jones, Jesse D., to Ethyl Corporation. Polyethylene terephthalate blends. 4,526,923, Cl. 524-502.000.
Horowicz, Leon, to Schlumberger Technology Corporation. Method for seismic exploration by vertical seismic profiling and installation for its implementation. 4,527,260, Cl. 367-27.000.
Hosaka, Akio: *See*—
Takase, Sadao; Oshiage, Katsunori; Yamamoto, Akito; and Hosaka, Akio, 4,527,248, Cl. 364-565.000.
Hoshikawa, Jun; Iwashita, Yukihiro; and Suzuawa, Osamu, to Epson Corporation. Liquid crystal display panel and process for the production thereof. 4,526,818, Cl. 428-1.000.
Hoshizaki Electric Co., Ltd.: *See*—
Suyama, Tomio; and Osawa, Kazuya, 4,526,014, Cl. 62-347.000.
Hosiden Electronics Co., Ltd.: *See*—
Tanaka, Masanori, 4,526,433, Cl. 339-75.0MP.
Hosoe, Kazuya: *See*—
Kinoshita, Takao; and Hosoe, Kazuya, 4,527,053, Cl. 250-201.000.
Hosogaya, Kazuyoshi: *See*—
Shudo, Yasunobu; Kano, Masayoshi; Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,526,121, Cl. 114-73.000.
Hosokawa, Yasuhiko; and Morishima, Naoki, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus for thyristor motor. 4,527,109, Cl. 318-715.000.
Hottendorf, Girard H.: *See*—
Williams, Patricia D.; and Hottendorf, Girard H., 4,526,888, Cl. 514-12.000.
Hough, David L.: *See*—
Clemens, A. H.; and Hough, David L., 4,526,568, Cl. 604-4.000.
House Food Industrial Co., Ltd.: *See*—
Hayase, Masao; and Araki, Yozo, 4,525,978, Cl. 53-167.000.
Houston, Douglas E.: *See*—
Anthony, Thomas R.; Houston, Douglas E.; and Loughran, James A., 4,527,183, Cl. 357-30.000.
Hovens, Paulus J. M., to U.S. Philips Corporation. Television receiver comprising a video signal detector of a type which detects with the aid of a reference signal. 4,527,196, Cl. 358-158.000.
Hovey, Gordon E. Push-pull de-tiering system. 4,526,504, Cl. 414-661.000.
Howard, Alan N. Cereal snackfoods and compositions and methods for making the same. 4,526,800, Cl. 426-559.000.
Howarth, Thomas T.: *See*—
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,526,783, Cl. 424-114.000.
Howling, Richard J.: *See*—
Hunt, William V.; Coletta, John A.; Howling, Richard J.; and Higgs, Leonard, 4,525,885, Cl. 5-453.000.
HR Textron Inc.: *See*—
Runkel, Manfred A.; Hsu, William W.; Singer, Anthony E.; and Zlotski, William J., 4,526,058, Cl. 74-531.000.
Scott, Richard D., 4,526,189, Cl. 137-68.00A.
Hsia, Edward S.; Emani, Raghuram J.; and Starkweather, John H., to General Electric Company. Multiple-impingement cooled structure. 4,526,226, Cl. 165-109.00R.
Hsiung, Thomas H.: *See*—
Beshty, Bahjat S.; Hatfield, W. Robert; Lee, Hyo C.; Heck, Ronald M.; and Hsiung, Thomas H., 4,526,614, Cl. 75-83.000.
Hsu, Chin C., to B. F. Goodrich Company, The. Polycarbonates having plasticizers with fugitive activity. 4,526,937, Cl. 524-724.000.
Hsu, Ming-Ta S.: *See*—
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-Ta S.; and Chen, Timothy S., 4,526,925, Cl. 524-548.000.
Hsu, William W.: *See*—
Runkel, Manfred A.; Hsu, William W.; Singer, Anthony E.; and Zlotski, William J., 4,526,058, Cl. 74-531.000.
Hubel, Werner: *See*—
Disteldorf, Josef; zur Hausen, Manfred; Hubel, Werner; and Kriebel, Gunter, 4,526,971, Cl. 546-186.000.
Huber, Lothar, to Luk Lamellen und Kupplungsbau GmbH. Fluid-operated clutch disengaging apparatus. 4,526,258, Cl. 192-88.00A.
Huber, Louis E., Jr.; and Schwartz, Harry D., to Cabot Corporation. Tantalum-columbium-molybdenum-tungsten alloy. 4,526,749, Cl. 420-427.000.
Hubler, Lawrence C.: *See*—
Taylor, Thomas N.; Ellis, John R.; and Hubler, Lawrence C., 4,526,309, Cl. 226-33.000.
Hubner, Hans J. Process and device for indicating and evaluating environmental parameters. 4,526,028, Cl. 73-23.000.
Hubschmid, Walter, to Walter Hubschmid & Sohn. Instrument for the treatment of interdental surfaces. 4,526,541, Cl. 433-165.000.
Hug, Paul; and Tavares, Antonio, to Storage Technology Partners. Solder wave apparatus and method. 4,526,313, Cl. 228-180.100.
Hughes, Charles C., to R. A. Jones & Co. Inc. Flap separator for a cartoning machine. 4,526,564, Cl. 493-183.000.
Hughes, David T.: *See*—
Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., 4,527,237, Cl. 364-200.000.
Hughson, Robert A.; and Osborne, Eddie A., to Shell Offshore Inc. Method of replacing a corroded well conductor in an offshore platform. 4,526,232, Cl. 166-339.000.
Huignard, Jean P., to Thomson CSF. Device for evolutive illumination of an object. 4,527,132, Cl. 332-7.510.
Hummel, John E.; and Baab, William E., to Linear Films, Inc. Method of making flat bottom plastic bag. 4,526,565, Cl. 493-196.000.
Humphrey, Brock H.: *See*—
Humphrey, Frederick H.; and Humphrey, Brock H., 4,526,195, Cl. 137-512.100.
Humphrey, Frederick H.; and Humphrey, Brock H., to IIC Mechanical Products Limited. Reinforced plastic structure such as a valve. 4,526,195, Cl. 137-512.100.
Hunt, William V.; Coletta, John A.; Howling, Richard J.; and Higgs, Leonard, to Mediscus Products Limited. Support appliance for mounting on a standard hospital bed. 4,525,885, Cl. 5-453.000.
Huntington, William. Fishing lure arrangement. 4,525,948, Cl. 43-42.040.
Hurley Moate Engineering Company Limited: *See*—
Clements, Trevor F., 4,526,638, Cl. 156-159.000.
Hurt, William B.: *See*—
Baker, Gary C., 4,526,227, Cl. 165-124.000.
Huster, Bernhard, to Deutsche Geratebau GmbH. Installation for measuring liquid quantities. 4,526,032, Cl. 73-245.000.
Hutchinson, Francis G.: *See*—
Churchill, Jeffrey R.; and Hutchinson, Francis G., 4,526,938, Cl. 525-415.000.
Huttunen, Jouko: *See*—
Selin, Johan; Huttunen, Jouko; Turunen, Olli; Eklund, Vidar; and Ekman, Kurt, 4,526,620, Cl. 106-203.000.
Hwang, Jiann-Yang: *See*—
Friedlaender, Fritz J.; Takayasu, Makoto; Hwang, Jiann-Yang; and Petrakis, Leon, 4,526,681, Cl. 209-214.000.
Iacovangelo, Charles D.; and Browall, Kenneth W., to United States of America, Energy. Coated powder for electrolyte matrix for carbonate fuel cell. 4,526,812, Cl. 427-115.000.
Ibata, Sachiko, to Nippon Tenshashi Kabushiki Kaisha. Polisher element. 4,526,589, Cl. 51-295.000.
IBG International, Inc.: *See*—
Kaiser, Fredrick P.; and Lapp, Theodore R., 4,527,247, Cl. 364-550.000.
Ibigawa Electric Industry Co., Ltd.: *See*—
Enomoto, Ryo, 4,526,734, Cl. 264-13.000.
Ichijima, Seiji; and Hirose, Takeshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material comprising coupler having nitrogen-containing heterocyclic ring. 4,526,861, Cl. 430-385.000.
Ickes, John C. Apparatus for controlling flow of combustion products. 4,526,160, Cl. 126-292.000.
Ide, Russell D. Hydrodynamic bearing surface for high loads and low viscosity lubricating fluids. 4,526,482, Cl. 384-104.000.
Ideya Co., Ltd.: *See*—
Fukuda, Yoshinori, 4,526,185, Cl. 134-159.000.
Idota, Yoshio, to Fuji Photo Film Co., Ltd. Image formation by silver salt diffusion transfer process comprising mercaptotriazole and thiouracil. 4,526,857, Cl. 430-248.000.
Igarashi, Kimizo; Takigawa, Katsumi; Muchi, Tsuneo; Matsumoto, Yoshio; Ueno, Kiichi; and Ohkoshi, Akio, to Sony Corporation. Method of fixing an electron gun assembly into the neck of a cathode ray tube and structure so produced. 4,526,601, Cl. 65-59.100.
IIC Mechanical Products Limited: *See*—
Humphrey, Frederick H.; and Humphrey, Brock H., 4,526,195, Cl. 137-512.100.
Iijima, Junko: *See*—
Fujisawa, Noriyoshi; Ooshima, Katsuaki; Iijima, Junko; and Deguchi, Katsuhiko, 4,526,710, Cl. 252-545.000.
Ijichi, Sadayoshi; and Yamamoto, Masaki, to Alps Electric Co., Ltd. Frequency synthesizing type electronic tuner. 4,527,280, Cl. 455-183.000.
Ikeda, Yoshiaki, to Seikosha Co., Ltd. Multicolor ink ribbon cassette. 4,526,487, Cl. 400-201.000.
Ikegami, Tadashi: *See*—
Sakurai, Hisaya; Ikegami, Tadashi; Miya, Masayoshi; and Takaya, Katsuhiko, 4,526,941, Cl. 526-127.000.
Illinois Tool Works Inc.: *See*—
Petri, Hector D., 4,525,904, Cl. 24-458.000.
Imada, Isuke: *See*—
Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, 4,526,719, Cl. 260-346.00R.
Imagawa, Toshiyuki; and Ohara, Kazuya, to Clarion Co., Ltd. Autoscan changeover system for two-band radio receiver employing PLL frequency synthesizers. 4,527,281, Cl. 455-165.000.
Imai, Motomasa: *See*—
Kanai, Hideyuki; Furukawa, Osamu; Imai, Motomasa; and Takahashi, Takashi, 4,527,146, Cl. 338-20.000.
Imaizumi, Hiroyuki: *See*—
Yoshizawa, Akinori; Nakane, Yasuo; Hagimori, Kenji; Ohgai, Koya; Arisawa, Norisada; Takahashi, Tadashi; Maekawara, Hideaki; Imaizumi, Hiroyuki; Tsuchida, Hideyuki; Mieno, Eiichirou; and Sugino, Kenji, 4,526,611, Cl. 75-0.50B.
Imamura, Eiji; and Shoji, Toshio, to Murata Manufacturing Co., Ltd. Flyback transformer with high voltage variable resistor built therein. 4,527,229, Cl. 363-126.000.
Imazaki, Hideyuki; and Sakamoto, Kazuhiko, to Nitto Kasei Co., Ltd. Antifouling agent. 4,526,932, Cl. 525-326.700.
Imoto, Tadasi: *See*—
Norota, Susumu; Segawa, Yasuhiko; Kiriyama, Tsutomu; Emi, Shingo; Imoto, Tadasi; and Yamauchi, Tetsuo, 4,526,735, Cl. 264-27.000.

Imperial Chemical Industries Limited: *See*—
Bloomfield, Allen A.; and Goodall, James R., 4,526,326, Cl. 242-43.200.
Imperial Chemical Industries PLC: *See*—
Churchill, Jeffrey R.; and Hutchinson, Francis G., 4,526,938, Cl. 525-415.000.
Day, Michael A.; and Reid, Alistair, 4,526,885, Cl. 502-327.000.
Imperial Clevite Inc.: *See*—
Kolchinsky, Abel E.; and Kazi, Shaukat, 4,526,340, Cl. 251-38.000.
Inagaki, Hajime: *See*—
Sakashita, Takeshi; Inagaki, Hajime; Todo, Akira; and Nakano, Takayuki, 4,526,920, Cl. 524-850.000.
Inagaki, Natsuo: *See*—
Kaneda, Hidehiko; Inagaki, Natsuo; and Yamaguchi, Hitoshi, 4,526,239, Cl. 173-73.000.
Industria Prefabbricati Affini I.P.A. S.p.A.: *See*—
Migliacci, Antonio; Bono, Giancarlo; and Tognoli, Piero, 4,526,739, Cl. 264-228.000.
Industrial Filter & Pump Mfg. Co.: *See*—
Schmidt, Henry, Jr.; Cederholm, Allen E.; and Zievers, James F., 4,526,688, Cl. 210-323.200.
Industrie Vernici Italiane S.p.A.: *See*—
Biorcio, Luciano; and Mensi, Carlo, 4,526,912, Cl. 523-456.000.
Ingenbleek, Yves; Traitler, Helmut; and Wessely, Jean-Yves, to Nestec, S.A. Lipid composition for oral, enteral or parenteral nutrition. 4,526,793, Cl. 426-72.000.
Ingersoll-Rand Company: *See*—
Parker, Charles A., 4,526,523, Cl. 418-84.000.
Ingle, William M.; Peffley, Marilyn S.; and Setty, H. S. Nagaraja, to Motorola, Inc. Trichlorosilane production process. 4,526,769, Cl. 423-342.000.
Inman, Frank S., to Thiokol Corporation. Actuator for deploying flexible bodies. 4,525,999, Cl. 60-407.000.
Inman, James C.: *See*—
Holton, James A.; and Inman, James C., 4,526,086, Cl. 91-43.000.
Inokuchi, Iwane: *See*—
Honma, Masahiro; and Inokuchi, Iwane, 4,526,145, Cl. 123-357.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi; and Shimizu, Akihiko, 4,527,034, Cl. 219-69.00G.
Inoue, Kanji: *See*—
Ohno, Akira; and Inoue, Kanji, 4,526,628, Cl. 148-12.00B.
Inoue, Kichiro: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,526,894, Cl. 514-312.000.
Inoue, Kiyoshi; and Shimizu, Akihiko, to Inoue-Japax Research Incorporated; and Japax Incorporated. Electrode positioning method and apparatus for NC-EDM. 4,527,034, Cl. 219-69.00G.
Institut Pasteur: *See*—
Avrameas, Stratis; and Guesdon, Jean-Luc, 4,526,871, Cl. 436-504.000.
Institute for Industrial Research and Standards: *See*—
McLoughlin, Thomas P., 4,526,347, Cl. 256-33.000.
Intel Corporation: *See*—
Oto, Duane, 4,527,180, Cl. 357-23.600.
International Business Machines Corporation: *See*—
Bohg, Armin; Hartmann, Kurt; and Matthaei, Horst, 4,527,139, Cl. 335-256.000.
Christensen, Richard G.; and Moore, Robert L., 4,526,859, Cl. 430-314.000.
Dowden, Barry F.; Barclay, Donald J.; and Kirkman, David H., 4,526,441, Cl. 350-357.000.
Kekas, Dennis H.; Stilwell, George R., Jr.; Walsh, Robert M.; and Williams, Roger C., 4,527,285, Cl. 455-607.000.
Latta, Ernst-Eberhard; and Ronay, Maria, 4,526,629, Cl. 148-1.500.
Meyerson, Bernard S., 4,526,593, Cl. 55-385.00R.
Ryan, Charles T.; Scheuerlein, Roy E.; and Kasprzak, Lucian A., 4,527,254, Cl. 365-51.000.
Silvestri, Victor; and Tang, D. Duan-Lee, 4,526,631, Cl. 148-175.000.
Stammely, Thomas E., 4,527,216, Cl. 361-156.000.
International Environmental, Inc.: *See*—
Forbush, Donald C.; and Seamon, Glen R., 4,526,771, Cl. 423-543.000.
International Flavors & Fragrances Inc.: *See*—
Luccarelli, Domenick, Jr.; Mookherjee, Braja D.; Wilson, Richard A.; Zampino, Michael J.; and Bowen, David R., 4,526,798, Cl. 426-534.000.
International Paper Company: *See*—
Cassidy, Benjamin J., 4,526,317, Cl. 229-44.0CB.
Empie, Howard L., Jr., 4,526,760, Cl. 422-185.000.
International Telephone and Telegraph Corporation: *See*—
Bogan, Leonard E.; and Hamersley, Richard A., 4,527,266, Cl. 370-58.000.
Vincent, Arthur L; Robinson, James R.; and Ginkel, Ernst R., 4,526,755, Cl. 422-90.000.
Interzeag AG: *See*—
Hirsch, Joy, 4,526,452, Cl. 351-243.000.
Inui, Tomoyuki: *See*—
Takegami, Yoshinobu; and Inui, Tomoyuki, 4,526,878, Cl. 502-65.000.
IRECO Incorporated: *See*—
Lawrence, Larry D.; Sudweeks, Walter B.; and Larsen, Raymond D., 4,526,633, Cl. 149-109.600.
Irik, Gijsbert W.: *See*—
Boersma, Rintje; van Wijnandsbergen, Marius F. F.; Irik, Gijsbert W.; and Marien, Pieter, 4,527,220, Cl. 361-332.000.
Irvine Sensors Corporation: *See*—
Carson, John C.; and Clark, Stewart A., 4,525,921, Cl. 29-577.00C.
Ishibashi, Akira: *See*—
Hattori, Motonobu; Ishibashi, Akira; Ishida, Hiromi; and Nandoh, Kenji, 4,527,214, Cl. 361-96.000.
Ishibashi, Kazuhisa: *See*—
Miyamatsu, Yasunori; Kaga, Yasuo; Aizawa, Masanori; Ishibashi, Kazuhisa; and Ueno, Hiroshi, 4,526,287, Cl. 220-260.000.
Ishida, Hiromi: *See*—
Hattori, Motonobu; Ishibashi, Akira; Ishida, Hiromi; and Nandoh, Kenji, 4,527,214, Cl. 361-96.000.
Ishihara, Yasuo; Oda, Eiji; and Teranishi, Nobukazu, to Nippon Electric Co., Ltd. Semiconductor photoelectric converter making excessive charges flow vertically. 4,527,182, Cl. 357-24.000.
Ishii, Fumiaki; Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Takamura, Koji; and Nakamura, Takeaki, to Olympus Optical Co., Ltd. Method of cleaning endoscope channels. 4,526,623, Cl. 134-21.000.
Ishii, Fumiaki: *See*—
Takamura, Koji; Ishii, Fumiaki; Nakajima, Yukio; Yabe, Hisao; Sasa, Hiroyuki; and Nakamura, Takeaki, 4,526,622, Cl. 134-21.000.
Ishii, Susumu, to Yoshida Kogyo K.K. Slider for slide fastener. 4,525,903, Cl. 24-429.000.
Ishii, Toshiyuki: *See*—
Kutsuwa, Yoshikazu; Kitahara, Kouji; and Ishii, Toshiyuki, 4,526,707, Cl. 252-511.000.
Ishizuka, Tadatsugu: *See*—
Sato, Kazuhiro; Kumagai, Takashi; Ishizuka, Takuo; and Ishizuka, Tadatsugu, 4,527,253, Cl. 364-900.000.
Ishizuka, Takuo: *See*—
Sato, Kazuhiro; Kumagai, Takashi; Ishizuka, Takuo; and Ishizuka, Tadatsugu, 4,527,253, Cl. 364-900.000.
Isomura, Hiroshi: *See*—
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Itagaki, Hideyuki: *See*—
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Itaya, Takashi: *See*—
Kikuchi, Hiroshi; Tanuma, Jiro; Koshida, Yoshinori; and Itaya, Takashi, 4,526,486, Cl. 400-185.000.
Ito, Kathuhiko; Sugii, Hiroshi; Takata, Yukito; and Kokubu, Kyoichiro, to Daiichi Kigenso Kagaku Kogyo Co., Ltd. Methods for preparing amorphous zirconium phosphosilicate. 4,526,765, Cl. 423-306.000.
Ito, Katsunori: *See*—
Yamazoe, Hisamitsu; Matsuura, Hideki; Ito, Katsunori; and Ohba, Masahiro, 4,526,042, Cl. 75-861.750.
Ito, Kazuomi: *See*—
Nishizawa, Jun-ichi; Ito, Kazuomi; and Okuno, Yasuo, 4,526,632, Cl. 148-171.000.
Ito, Koji; Onishi, Masanori; and Hayashi, Hisao, to Tokyo Keiki Company Limited. Character information separating apparatus for printed character reading systems. 4,527,283, Cl. 382-9.000.
Ito, Shoichi: *See*—
Yamauchi, Koji; Ito, Shoichi; and Tadokoro, Hiroyuki, 4,527,093, Cl. 315-307.000.
Ito, Yoshinori, to Nippon Electric Co., Ltd. Echo canceller for a long-distance telephone network. 4,527,020, Cl. 179-170.200.
Itou, Takeo: *See*—
Watanabe, Shingo; and Itou, Takeo, 4,526,854, Cl. 430-176.000.
ITT Industries, Inc.: *See*—
Giebel, Burkhard, 4,527,256, Cl. 365-154.000.
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and by Gachegova, Lidia T., administrator. Apparatus for chlorination of molten magnesium chloride salts. 4,526,761, Cl. 422-224.000.
Iwasaki, Kyuhachiro; Ameyama, Minoru; Ebi, Yutaka; Jinnai, Koichiro; and Sato, Tsutomu, to Ricoh Company Ltd. Ink jet waste and replenish ink system. 4,527,170, Cl. 346-75.000.
Iwashita, Yukihiro: *See*—
Hoshikawa, Jun; Iwashita, Yukihiro; and Suzuawa, Osamu, 4,526,818, Cl. 428-1.000.
Iwata, Hitoshi; Hashimoto, Yoshihiro; and Yamada, Katsuhiko, to Sumitomo Electric Industries, Limited. Method and apparatus for direct heat treatment of medium- to high-carbon steel rods. 4,526,627, Cl. 148-12.00B.
Iwata, Shuji. Movable calender marker. 4,525,943, Cl. 40-110.000.
Iwatsu Electric Co., Ltd.: *See*—
Enda, Toyoaki, 4,527,108, Cl. 318-687.000.
J. H. Diamond Company: *See*—
Winkler, David S.; and Diamond, Jeffrey H., 4,526,913, Cl. 524-31.000.
J. I. Case Company: *See*—
Hale, Richard A.; Olsson, Nils O.; and Reiff, Thomas F., 4,526,377, Cl. 277-9.000.
Hennessey, Richard G.; Beemer, Richard B.; and Melles, Harold W., 4,526,255, Cl. 192-3.580.
Schroeder, Philip W., 4,526,425, Cl. 301-36.00R.

Jachimowicz, Felek; and Hansson, Per E. A., to W. R. Grace & Co. Process for the preparation of polymeric amine containing products. 4,526,936, Cl. 525-379.000.

Jackson, Winston J., Jr.: *See*—
Morris, John C.; and Jackson, Winston J., Jr., 4,526,822, Cl. 428-35.000.

Jacob, Joseph: *See*—
Rudy, Michael A.; and Jacob, Joseph, 4,526,177, Cl. 128-737.000.

Jacobs, Erwin P.; and Schwabe, Ulrich, to Siemens Aktiengesellschaft. Method of making CMOS circuits by twin tub process and multiple implantations. 4,525,920, Cl. 29-571.000.

Jacobsen, Ralph O., to Kyle Welding & Machine Shop Ltd. Field marker for a sprayer boom. 4,526,236, Cl. 172-126.000.

Jahn, Ulrich: *See*—
Molnar, Istvan; Thiele, Kurt; Geissmann, Felix; and Jahn, Ulrich, 4,526,898, Cl. 514-392.000.

Japan Marine Science & Technology Center: *See*—
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Japax Incorporated: *See*—
Inoue, Kiyoshi; and Shimizu, Akihiko, 4,527,034, Cl. 219-69.00G.

Jardine, George W. Glare attenuating attachment for vehicle sun visors. 4,526,415, Cl. 296-97.00F.

Jarreau, Francois-Xavier; and Koenig, Jean-Jacques, to Etablissements NATIVELLE S.A. 3-Pyridyl-5-alkoxy-pyrazole derivatives and pharmaceutical composition for use as a cardiotonic medication. 4,526,895, Cl. 514-341.000.

JayVol Inc.: *See*—
Waxman, Jay, 4,526,292, Cl. 221-97.000.

JBC Systems, Inc.: *See*—
Axelson, John A., Jr.; and Wise, Kenneth M., 4,527,245, Cl. 364-478.000.

Jeandot, Marcel: *See*—
Granday, Georges; and Jeandot, Marcel, 4,526,792, Cl. 426-56.000.

Jennings, Bobby D.: *See*—
Pike, Jesse L.; and Jennings, Bobby D., 4,525,949, Cl. 43-57.300.

Jerabek, Charles F., to GTE Products Corporation. Bar evaporation source having improved wettability. 4,526,840, Cl. 428-596.000.

Jialanella, Gary L., to Loctite Corporation. Method and composition for repairing rear window defoggers. 4,526,811, Cl. 427-108.000.

Jinnai, Koichiro: *See*—
Iwasaki, Kyuhachiro; Ameyama, Minoru; Ebi, Yutaka; Jinnai, Koichiro; and Sato, Tsutomu, 4,527,170, Cl. 346-75.000.

Johannson, Richard J., to Towmotor Corporation. Chain retention device. 4,526,251, Cl. 187-9.00R.

Johansen, Kjell E. Motorized cart for berry-picking, weeding and the like. 4,526,248, Cl. 180-89.100.

Johansson, Bengt A.; and Brodin, Peter, to AccuRay Corporation. Apparatus for control of the slice opening on a slice lip on a headbox. 4,526,654, Cl. 162-259.000.

Johansson, Kenneth L.: *See*—
Hallee, Donald O.; Lake, Harold; Johansson, Kenneth L.; and Graves, Thomas B., 4,527,271, Cl. 371-20.000.

John Wyeth & Brother Limited: *See*—
Shepherd, Robin G., 4,526,970, Cl. 546-169.000.
Ward, Terence J., 4,526,967, Cl. 546-95.000.

Johnson, Bruce K.; and Schettino, Anthony J., to Polaroid Corporation. Method of and apparatus for distinguishing between exposed and unexposed film units. 4,526,453, Cl. 354-181.000.

Johnson, Bryce V.; Karayannis, Nicholas M.; and Skryantz, John S., to Standard Oil Company (Indiana). Mixed ester retreated propylene polymerization catalyst. 4,526,882, Cl. 502-105.000.

Johnson, David E., to Mobil Oil Corporation. High-speed apparatus and method for trimming thermoformed articles. 4,526,074, Cl. 83-97.000.

Johnson, David E.; Aebersold, Larry A.; and McCall, Kenneth E., to Arcair Company. Electrode drive and nozzle system for an automatic air carbon-arc cutting and gouging torch. 4,527,037, Cl. 219-69.00R.

Johnson, Graham: *See*—
Ross, Barry C.; Johnson, Graham; and Yeomans, Michael A., 4,526,718, Cl. 260-239.00A.

Johnson, Leighton C.: *See*—
Boger, David L.; Johnson, Leighton C.; and Pugh, Jerry T., 4,526,753, Cl. 422-56.000.

Johnson, Nigel, deceased: *See*—
Betts, Max W.; Johnson, Nigel, deceased; Bennett, Ernest W., executor; and Bennett, Joyce H., executor, 4,526,019, Cl. 66-132.00R.

Johnson, Paul H. Cellular heap leach process and apparatus. 4,526,615, Cl. 75-101.00R.

Johnson, Robert A., to Motorola, Inc. Self-tensioning differential capstan cable drive mechanism. 4,526,050, Cl. 74-89.220.

Johnson, Timothy W.; and Stone, Mark L., to Phillips Petroleum Company. Poly(arylene sulfide) electrical component. 4,527,219, Cl. 361-323.000.

Jones, Andrew: *See*—
Chaplin, George B. B.; Jones, Andrew; and Jones, Owen, 4,527,282, Cl. 381-71.000.

Jones, Arthur T.: *See*—
Lewarchik, Ronald J.; Murray, Kevin P.; Donovan, Marcella G.; and Jones, Arthur T., 4,526,939, Cl. 525-438.000.

Jones, Bobby L. Foldable carrying device. 4,526,414, Cl. 294-143.000.

Jones, Charles E.; and Weiss, Mark A., to FMC Corporation. Encapsulated bleach composition and method of preparation. 4,526,699, Cl. 252-99.000.

Jones, Dana P.: *See*—
Schimmel, William P.; Barker, Clifford S.; and Jones, Dana P., 4,526,747, Cl. 419-8.000.

Jones, Donald W., to General Electric Company. Method of making permanent magnet rotor. 4,525,925, Cl. 29-598.000.

Jones, James E.: *See*—
Das, Suryya K.; Greigger, Paul P.; Boberski, William G.; Jones, James E.; Schappert, Raymond F.; and Seiner, Jerome A., 4,526,910, Cl. 523-220.000.

Jones, Jesse D.: *See*—
Hornbaker, Edwin D.; and Jones, Jesse D., 4,526,923, Cl. 524-502.000.

Jones, Lewis O.: *See*—
Boughton, Edward M.; and Jones, Lewis O., 4,526,851, Cl. 430-106.600.

Jones, Owen: *See*—
Chaplin, George B. B.; Jones, Andrew; and Jones, Owen, 4,527,282, Cl. 381-71.000.

Jonson, Bjorn: *See*—
Olsson, Sven-Gunnar; Jonson, Bjorn; and Neuman, Hanna, 4,526,188, Cl. 137-3.000.

Jonsson, Gote: *See*—
Sundberg, Staffan; and Jonsson, Gote, 4,526,556, Cl. 464-182.000.

Joo , Louis A.; Tucker, Kenneth W.; and Webb, Scott D., to Great Lakes Carbon Corporation. Cathodic component for aluminum reduction cell. 4,526,669, Cl. 204-243.00R.

Jope Manufacturing Co. Inc.: *See*—
Higginbotham, John A., 4,525,881, Cl. 4-496.000.

Joslyn Mfg. and Supply Co.: *See*—
Luehring, Elmer L., 4,527,028, Cl. 200-144.00B.

Joy, George C., III, to UOP Inc. Catalyst of uranium, platinum and rhodium for converting carbon monoxide, hydrocarbons and nitrogen oxides. 4,526,886, Cl. 502-339.000.

Joy, John R., to Williams International Corporation. Environmental protection system. 4,526,013, Cl. 62-236.000.

Joyama, Norio: *See*—
Oiso, Hisayoshi; Joyama, Norio; Fujimoto, Kazuhiro; and Okamoto, Kozo, 4,526,525, Cl. 425-9.000.

Jun-Ichi Nishizawa: *See*—
Nishizawa, Jun-ichi; Ito, Kazuomi; and Okuno, Yasuo, 4,526,632, Cl. 148-171.000.

Jung, Norbert; Lindner, Edmund; and Lohrbaecher, Volker, to BASF Aktiengesellschaft. Thermoplastic fuel tank having a splash baffle. 4,526,286, Cl. 220-22.000.

Justrite Manufacturing Company: *See*—
Flider, Frank S., 4,526,033, Cl. 73-322.000.

Kabushiki Kaisha Aoyama Seisakusho: *See*—
Kazino, Hiroshi; Isomura, Hiroshi; and Mizuno, Kozo, 4,525,912, Cl. 29-243.520.

Kabushiki Kaisha Daini Seikosha: *See*—
Murakami, Fumikazu, 4,526,477, Cl. 368-250.000.

Kabushiki Kaisha Musashino Kagaku Kenkyusho: *See*—
Kishida, Konosuke; and Hirokawa, Masaru, 4,526,904, Cl. 521-26.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Moriya, Tatsuo, 4,526,475, Cl. 368-157.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Oshima, Yujiro; and Aoyama, Taro, 4,526,143, Cl. 123-301.000.

Kade, Alexander, to General Motors Corporation. Four state DC motor controller. 4,527,103, Cl. 318-293.000.

Kadija, Igor V.: *See*—
Haque, Reza; Smith, Edward F., III; and Kadija, Igor V., 4,526,806, Cl. 427-41.000.

Kadowaki, Takashi: *See*—
Takada, Shun; Onodera, Kaoru; and Kadowaki, Takashi, 4,526,864, Cl. 430-551.000.

Kaga, Yasuo: *See*—
Miyamatsu, Yasunori; Kaga, Yasuo; Aizawa, Masanori; Ishibashi, Kazuhisa; and Ueno, Hiroshi, 4,526,287, Cl. 220-260.000.

Kahn, Henry. Cyanoacrylate root canal sealer. 4,526,544, Cl. 433-224.000.

Kai, Kazuo. Method of forming a wiring pattern on a wiring board. 4,527,041, Cl. 219-121.0LN.

Kai, Tatsuya, to Nikko Co., Ltd. Burner apparatus for smelting furnace. 4,526,531, Cl. 431-189.000.

Kaicher, Francis A. Solar roof assemblage and internally removable solar transparent roof cover. 4,526,161, Cl. 126-444.000.

Kaise, Toshiro: *See*—
Sato, Yasuo; Fukushima, Akio; Kaise, Toshiro; Honda, Yoshiyuki; Uemura, Kazuho; and Fujii, Manabu, 4,526,010, Cl. 62-126.000.

Kaiser, Fredrick P.; and Lapp, Theodore R., to IBG International, Inc. Environmental control system. 4,527,247, Cl. 364-550.000.

Kaiser, Steven W., to Union Carbide Corporation. Small olefin interconversions. 4,527,001, Cl. 585-643.000.

Kakii, Toshiaki; Toda, Yuichi; Matsuno, Koichiro; Usui, Yuichi; and Matsumoto, Michito, to Nippon Telegraph & Telephone Public Corporation; and Sumitomo Electric Industries Ltd. Method of heating thermal shrinkage tube and apparatus therefor. 4,526,732, Cl. 264-2.700.

Kakizaki, Shinobu; and Yamamoto, Yoshifumi, to Atsugi Motor Parts Co., Ltd. Electronic control system for adjustable shock absorbers. 4,526,401, Cl. 280-707.000.

Kali-Chemie Ag: *See*—
Thies, Peter W.; and David, Samuel, 4,526,991, Cl. 549-363.000.

Kalina, Davida W.: *See*—
Maas, Edward T., Jr.; and Kalina, Davida W., 4,526,774, Cl. 423-573.00R.
Kalomeris, Mary. Belts with concealed pockets. 4,525,879, Cl. 2-338.000.
Kamada, Akio: *See*—
Matsuyama, Junya; Kamada, Akio; Kawabata, Fumimaru; Uegaki, Tatsufumi; and Miyake, Shigeru, 4,527,033, Cl. 219-61.000.
Kamai, Toshimitsu, to Sony Corporation. Apparatus for reproducing video and audio signals. 4,527,203, Cl. 360-19.100.
Kamisaka, Makoto; Okamoto, Toshiro; Ohshima, Michio; and Tamai, Mamoru, to Mitsubishi Jukogyo Kabushiki Kaisha. Thermal cracking method for producing olefines from hydrocarbons. 4,527,002, Cl. 585-648.000.
Kamiya, Kimitaka, to 501 DX Antenna Company, Limited. Signal coupling apparatus. 4,527,136, Cl. 333-103.000.
Kamiya, Osamu: *See*—
Fujiyama, Yasutomo; and Kamiya, Osamu, 4,526,644, Cl. 156-345.000.
Kamiyama, Yasuo: *See*—
Nakayama, Yasuaki; and Kamiyama, Yasuo, 4,526,476, Cl. 368-189.000.
Kampf, Gunther: *See*—
Benninghoven, Alfred; Kampf, Gunther; and Holm, Reimer, 4,527,059, Cl. 250-288.000.
Kanade, Takeo: *See*—
Okada, Tokuji; and Kanade, Takeo, 4,526,106, Cl. 104-138.00G.
Kanai, Hideyuki; Furukawa, Osamu; Imai, Motomasa; and Takahashi, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Varistor. 4,527,146, Cl. 338-20.000.
Kanda, Hiroyuki: *See*—
Kimura, Kenzi; and Kanda, Hiroyuki, 4,527,140, Cl. 336-175.000.
Kaneda, Hidehiko; Inagaki, Natsuo; and Yamaguchi, Hitoshi, to Japan Marine Science & Technology Center. Underwater hydraulic tool. 4,526,239, Cl. 173-73.000.
Kanegafuchi Kagaku Kogyo Kabushiki: *See*—
Mathumoto, Shigemi; and Nagoshi, Fumiya, 4,526,928, Cl. 525-76.000.
Kano, Masayoshi: *See*—
Shudo, Yasunobu; Kano, Masayoshi; Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,526,121, Cl. 114-73.000.
Kano, Takehiko: *See*—
Okada, Hiroshi; Itagaki, Hideyuki; Kano, Takehiko; and Mosuko, Seiichi, 4,526,656, Cl. 202-158.000.
Kansa Corporation: *See*—
Swint, Ronnie K., 4,526,356, Cl. 270-55.000.
Kant, Rajni: *See*—
Mehrotra, Deepak; Kant, Rajni; and Patel, Kishor M., 4,527,115, Cl. 324-73.00R.
Kanten, H. Gorden: *See*—
Peerman, Dwight E.; Kanten, H. Gorden; and Bonnema, Kelvin K., 4,525,890, Cl. 15-193.000.
Kanto Seiki Kabushiki Kaisha: *See*—
Chigira, Junji, 4,526,012, Cl. 62-196.300.
Kao Corporation: *See*—
Fujisawa, Noriyoshi; Ooshima, Katsuaki; Iijima, Junko; and Deguchi, Katsuhiko, 4,526,710, Cl. 252-545.000.
Kuroda, Muthmi; Murata, Moriyasu; Takeda, Tsunesi; and Tamura, Junich, 4,526,698, Cl. 252-99.000.
Kaplan, Jonathan I.: *See*—
Fantone, Stephen D.; Goward, Robert M.; and Kaplan, Jonathan I., 4,526,444, Cl. 350-501.000.
Karasaki, Toshihiko: *See*—
Kawamura, Kunio; Mukai, Hiromu; and Karasaki, Toshihiko, 4,526,458, Cl. 354-406.000.
Karayannis, Nicholas M.: *See*—
Johnson, Bryce V.; Karayannis, Nicholas M.; and Skryantz, John S., 4,526,882, Cl. 502-105.000.
Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Bogucki-Land, Bogdan, 4,525,905, Cl. 28-185.000.
Karvinen, Mikko; and Laapotti, Jorma, to Valmet Oy. Press section with separate press nips in a paper machine. 4,526,655, Cl. 162-360.100.
Kaser, Klaus: *See*—
Hirschmann, Adolf M.; Kaser, Klaus; Rieker, Hans; Busch, Hans-Peter; Rathke, Willi; and Maul, Heinz P., 4,526,294, Cl. 222-47.000.
Kasprzak, Lucian A.: *See*—
Ryan, Charles T.; Scheuerlein, Roy E.; and Kasprzak, Lucian A., 4,527,254, Cl. 365-51.000.
Kasprzyk, Martin R.: *See*—
Ten Eyck, Monika O.; Kasprzyk, Martin R.; and Tressler, Richard E., 4,526,826, Cl. 428-131.000.
Kasukawa, Yasuhiko, to NEC Corporation. Connector with mechanism for coupling and uncoupling plurality of blocks. 4,526,431, Cl. 339-45.00R.
Katada, Hirofumi: *See*—
Tsuji, Hiroshi; and Katada, Hirofumi, 4,526,273, Cl. 206-229.000.
Katagiri, Hidenori: *See*—
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,526,610, Cl. 75-0.5BC.
Kato, Kazuo: *See*—
Kuboki, Shigeo; Kato, Kazuo; and Miyakawa, Nobuaki, 4,527,148, Cl. 340-347.0AD.
Kato, Shigeru: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahashi, Toshinori; and Kiuchi, Tsutomu, 4,527,171, Cl. 346-76.0PH.
Kato, Shogo: *See*—
Ura, Hiroaki; and Kato, Shogo, 4,526,358, Cl. 271-34.000.
Kaufman, Arthur; and Terry, Peter L., to Engelhard Corporation. Film bonded fuel cell interface configuration. 4,526,843, Cl. 429-26.000.
Kawabata, Fumimaru: *See*—
Matsuyama, Junya; Kamada, Akio; Kawabata, Fumimaru; Uegaki, Tatsufumi; and Miyake, Shigeru, 4,527,033, Cl. 219-61.000.
Kawachi, Yasunori: *See*—
Kishida, Kazuo; Hasegawa, Akira; Kawachi, Yasunori; Kawasaki, Hiroshi; and Mizukoshi, Hiroshi, 4,526,929, Cl. 525-80.000.
Kawai, Mikio: *See*—
Yoshimoto, Teruko; Kawai, Mikio; and Kunimi, Hitoshi, 4,526,659, Cl. 204-56.00R.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,526,081, Cl. 84-1.230.
Kawamata, Kiyoshi: *See*—
Nakajima, Jun; Araya, Takeshi; Aso, Tadashi; Kawamata, Kiyoshi; and Sugimoto, Kinji, 4,527,045, Cl. 219-130.310.
Kawamoto, Mutsumi: *See*—
Sakakibara, Shiro; and Kawamoto, Mutsumi, 4,526,061, Cl. 74-689.000.
Sakakibara, Shiro; and Kawamoto, Mutsumi, 4,526,062, Cl. 74-689.000.
Kawamura, Kunio; Mukai, Hiromu; and Karasaki, Toshihiko, to Minolta Camera Kabushiki Kaisha. Focus condition detecting device for cameras. 4,526,458, Cl. 354-406.000.
Kawamura, Reiki; Tanaka, Takuo; Asano, Toshio; and Sawada, Yasuhiro, to Toyota Jidosha Kabushiki Kaisha; and Takashimaya Nippatsu Kogyo Co., Ltd. Seat cover fixing construction with slimmed section mounting band. 4,526,420, Cl. 297-218.000.
Kawasaki, Hiroshi: *See*—
Kishida, Kazuo; Hasegawa, Akira; Kawachi, Yasunori; Kawasaki, Hiroshi; and Mizukoshi, Hiroshi, 4,526,929, Cl. 525-80.000.
Kawasaki Steel Corporation: *See*—
Matsuyama, Junya; Kamada, Akio; Kawabata, Fumimaru; Uegaki, Tatsufumi; and Miyake, Shigeru, 4,527,033, Cl. 219-61.000.
Kawashima, Yoshiharu: *See*—
Ohashi, Shigeo; and Kawashima, Yoshiharu, 4,527,023, Cl. 200-11.00G.
Kawazoe, Shunji: *See*—
Chiba, Hiromasa; Harada, Takakiyo; Kumahara, Katsumi; Kawazoe, Shunji; and Sato, Akihiro, 4,526,931, Cl. 525-268.000.
Kay, Edward L.; and Gutierrez, Richard, to Firestone Tire & Rubber Company, The. Process for extracting rubber and by-products from guayule and guayule-like shrubs. 4,526,959, Cl. 528-930.000.
Kaye, Wilbur I., to Beckman Instruments, Inc. Stray light measurement and compensation. 4,526,470, Cl. 356-319.000.
Kazi, Shaukat: *See*—
Kolchinsky, Abel E.; and Kazi, Shaukat, 4,526,340, Cl. 251-38.000.
Kazino, Hiroshi; Isomura, Hiroshi; and Mizuno, Kozo, to Kabushiki Kaisha Aoyama Seisakusho. Pierce nut and a back-up die used in combination therewith. 4,525,912, Cl. 29-243.520.
Kazunari Yamada: *See*—
Suzuki, Kenichi; and Yamada, Kazunari, 4,527,153, Cl. 340-572.000.
Kearney, Susan D.; and Moses, Peter R., to Duracell Inc. Corrosion prevention additive. 4,526,846, Cl. 429-194.000.
Keene Corporation: *See*—
Sangiamo, Richard; and Russello, Thomas, 4,527,224, Cl. 362-282.000.
Keith Industries Incorporated: *See*—
Scott, William A.; and Penner, Bernard, 4,526,180, Cl. 130-27.00R.
Kekas, Dennis H.; Stilwell, George R., Jr.; Walsh, Robert M.; and Williams, Roger C., to International Business Machines Corporation. Pluggable terminal architecture. 4,527,285, Cl. 455-607.000.
Kellaway, Michael J.: *See*—
Harrison, William J.; Reynolds, Andrew J.; Kellaway, Michael J.; MacMichael, Donald B. A.; and Miller, Anne T., 4,526,215, Cl. 141-83.000.
Kelley Company, Inc.: *See*—
Erlandsson, Kjell I.; and Weishar, William B., 4,525,887, Cl. 14-71.300.
Kelley, Robert G.: *See*—
Ruf, Walter; and Kelley, Robert G., 4,526,245, Cl. 177-160.000.
Kells Medical, Inc.: *See*—
Sheehan, Joseph C. M., 4,526,173, Cl. 128-335.000.
Kelman, Josh, to Owens-Corning Fiberglas Corporation. Basement wall insulating and waterproofing system and method. 4,525,960, Cl. 52-169.140.
Kelsey-Hayes Company: *See*—
Rozmus, Walter J., 4,526,748, Cl. 419-49.000.
Kendall Company, The: *See*—
Cianci, James P., 4,526,576, Cl. 604-322.000.
Kenkare, Divaker B.: *See*—
Marschner, Frank W.; Kenkare, Divaker B.; and Bowers, James H., 4,526,780, Cl. 424-66.000.
Kennecott Corporation: *See*—
Ten Eyck, Monika O.; Kasprzyk, Martin R.; and Tressler, Richard E., 4,526,826, Cl. 428-131.000.
Kenoun, Robert. Electronic water ejecting game. 4,526,366, Cl. 273-1.0GC.

Keogh, Michael J., to Union Carbide Corporation. Production of water-curable, silane modified thermoplastic polymers. 4,526,930, Cl. 525-105.000.

Kern, Gilbert G. Attachment clip for suspended woodbeam ceiling. 4,525,971, Cl. 52-484.000.

Kernforschungsanlage Julich GmbH: *See*—
Gupta, Ashok K.; Gyarmati, Erno ; Munzer, Rudolf; and Naoumidis, Aristides, 4,526,649, Cl. 156-629.000.

Kerotest Manufacturing Corp.: *See*—
Thomas, John H., 4,526,341, Cl. 251-63.500.

Kerr Glass Manufacturing Corporation: *See*—
Herr, James E., 4,526,281, Cl. 215-211.000.

Keshavan, Madapusi K.; and Weatherly, Merle H., to Union Carbide Corporation. Abrasion resistant coating composition. 4,526,618, Cl. 106-1.050.

Keshtbod, Parviz, to Signetics Corporation. Non-volatile static random-access memory cell. 4,527,255, Cl. 365-154.000.

Kesselring, Lutz; and Frodrich, Horst, to MAPA GmbH Gummi-und Plastikwerke. Feeding teat, opening instrument and holder. 4,526,274, Cl. 206-231.000.

Keyes, Bonnie: *See*—
Magnus, George; Smith, Norman; and Keyes, Bonnie, 4,526,908, Cl. 521-172.000.

Khristjuk, Grigory P.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhaviev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.

Kicherer, Robert, to E.G.O. Elektro-Gerate Blanc und Fischer. Hotplate. 4,527,050, Cl. 219-464.000.

Kido, Yasuji; Yoshida, Tsutomu; Hamakado, Toshinari; Anno, Masami; Harada, Takahiro; and Motoki, Yoshinobu, to Fujizoki Pharmaceutical Co., Ltd. Angiotensin I-converting enzyme inhibitor and preparation of the same. 4,526,866, Cl. 435-68.000.

Kiener, Heinz: *See*—
Brandenstein, Manfred; Walter, Lothar; and Kiener, Heinz, 4,526,259, Cl. 192-91.00A.
Frase, Dietmar; Eisenkolb, Roland; Kiener, Heinz; and Harant, Guter, 4,526,485, Cl. 384-486.000.

Kies, Anton M., to Erico Products, Inc. Electrical bracket. 4,526,437, Cl. 339-272.00R.

Kies, Anton M.; and Samas, Mark V., to Erico Products, Inc. Tapered thread cutting machine. 4,526,496, Cl. 408-179.000.

Kifer, David E., to Oatey Co. Roof flashing. 4,526,407, Cl. 285-42.000.

Kifor, Harry T.: *See*—
Burkley, Thomas E.; and Kifor, Harry T., 4,526,207, Cl. 138-93.000.

Kijima, Takao; and Maebayashi, Jiro, to Mazda Motor Corporation. Vehicle rear suspension mechanism. 4,526,400, Cl. 280-701.000.

Kikis, Evangelos T. Puzzle toy. 4,526,372, Cl. 273-153.00S.

Kikkawa, Shigeru: *See*—
Nagashima, Masayoshi; Yamane, Hiroshi; Kikkawa, Shigeru; and Teraki, Yoshinori, 4,527,172, Cl. 346-76.0PH.

Kikuchi, Hiroshi; Tanuma, Jiro; Koshida, Yoshinori; and Itaya, Takashi, to Oki Electric Industry Co., Ltd. Serial printer. 4,526,486, Cl. 400-185.000.

Kilborn, Hilary M. H., to Burroughs Corporation. Autoteller card handling mechanism. 4,527,052, Cl. 235-485.000.

Kilgour, John A.; and Petty, Herbert E., to Union Carbide Corporation. Process for the preparation of N-substituted aminoalkylsilanes. 4,526,996, Cl. 556-413.000.

Kilpatrick, Ewen P., to Repco Limited. Emergency locking reel for belts. 4,526,328, Cl. 242-107.40A.

Kim, Joon S.: *See*—
Greenblatt, Abraham J.; and Kim, Joon S., 4,526,092, Cl. 99-575.000.

Kimberly-Clark Corporation: *See*—
Lau, Jark C., 4,526,733, Cl. 264-12.000.
Whitehead, Howard A., 4,526,825, Cl. 428-74.000.

Kimura, Katsuhiro: *See*—
Endo, Akira; and Kimura, Katsuhiro, 4,527,160, Cl. 343-8.000.

Kimura, Kenzi; and Kanda, Hiroyuki, to Midori-Anzen Industry Co., Ltd. Split type zero-phase transformer with holder for mounting on an electrical cable. 4,527,140, Cl. 336-175.000.

Kimura, Shigeru: *See*—
Nakama, Daiji; and Kimura, Shigeru, 4,526,333, Cl. 248-73.000.

Kindlmann, Peter J., to Timex Corporation. Drive circuit for capacitive electroluminescent panels. 4,527,096, Cl. 315-169.300.

King, Clifford P.; and Pierce, Trudy L. Security system for storage tanks. 4,526,301, Cl. 222-153.000.

King, William R. Particle form evaporation start-up. 4,526,958, Cl. 528-502.000.

Kinney, Thomas B.: *See*—
Chin, Albert K.; and Kinney, Thomas B., 4,526,175, Cl. 128-344.000.

Kinoshita, Takao; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Focus detecting device with relative movement detection. 4,527,053, Cl. 250-201.000.

Kinoshita, Takao; Tsunekawa, Tokuichi; and Sato, Yuichi, to Canon Kabushiki Kaisha. Solid state image pick-up device. 4,527,199, Cl. 358-213.000.

Kinze Manufacturing, Inc.: *See*—
Kinzenbaw, Jon E., 4,526,235, Cl. 172-126.000.

Kinzenbaw, Jon E., to Kinze Manufacturing, Inc. Agricultural row marker. 4,526,235, Cl. 172-126.000.

Kiovsky, Joseph R.; and Hendrick, Clifford L., to Millipore Corporation. Apparatus for nucleic acid quantification. 4,526,690, Cl. 210-335.000.

Kirby, Theodore A.: *See*—
Bihl, Claudia J., 4,526,164, Cl. 128-94.000.

Kirchbrucher, Rudiger: *See*—
Becker, Kunibert; Elsner, Burckhardt; and Kirchbrucher, Rudiger, 4,526,495, Cl. 405-299.000.

Kiriseko, Tadashi, to Fujitsu Limited. Method of producing a semiconductor device. 4,525,922, Cl. 29-577.00C.

Kiriyama, Tsutomu: *See*—
Norota, Susumu; Segawa, Yasuhiko; Kiriyama, Tsutomu; Emi, Shingo; Imoto, Tadasi; and Yamauchi, Tetsuo, 4,526,735, Cl. 264-27.000.

Kirkman, David H.: *See*—
Dowden, Barry F.; Barclay, Donald J.; and Kirkman, David H., 4,526,441, Cl. 350-357.000.

Kirkman, Michael, to Augat Inc. Compliant pin for solderless termination to a printed wiring board. 4,526,429, Cl. 339-17.00C.

Kishida, Eiji: *See*—
Narasaka, Shin; Otsuka, Kazuo; and Kishida, Eiji, 4,526,148, Cl. 123-440.000.

Kishida, Kazuo; Hasegawa, Akira; Kawachi, Yasunori; Kawasaki, Hiroshi; and Mizukoshi, Hiroshi, to Mitsubishi Rayon Company, Limited. Resin composition usable without being coated. 4,526,929, Cl. 525-80.000.

Kishida, Konosuke; and Hirokawa, Masaru, to Kabushiki Kaisha Musashino Kagaku Kenkyusho. Method of regenerating cation exchange membrane by treatment with strong acid at above 110° C. 4,526,904, Cl. 521-26.000.

Kistler, Walter P.: *See*—
EerNisse, Errol P.; Gaiser, Mark D.; Hanley, John P.; Kistler, Walter P.; Paros, Jerome M.; and Wiggins, Robert B., 4,526,247, Cl. 177-210.0FP.

Kitahara, Kouji: *See*—
Kutsuwa, Yoshikazu; Kitahara, Kouji; and Ishii, Toshiyuki, 4,526,707, Cl. 252-511.000.

Kitchens of Sara Lee, Inc.: *See*—
Wolf, Andrew, 4,526,795, Cl. 426-297.000.

Kitchin, Jonathan P., to Minnesota Mining and Manufacturing Company. Photographic process. 4,526,860, Cl. 430-373.000.

Kitko, David J.: *See*—
Hensley, Charles A.; and Kitko, David J., 4,526,700, Cl. 252-102.000.

Kiuchi, Tsutomu: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahashi, Toshinori; and Kiuchi, Tsutomu, 4,527,171, Cl. 346-76.0PH.

Klargester Environmental Engineering Ltd.: *See*—
Rowland, Gerald, 4,526,685, Cl. 210-138.000.

Klaubert, Dieter H.; and Sellstedt, John H., to American Home Products Corporation. Process for preparing 1-H-tetrazole-5-thiols and intermediate compounds. 4,526,978, Cl. 548-251.000.

Kleindienst Aquatec GmbH & Co. KG: *See*—
Muller, Heinz-Joachim, 4,526,870, Cl. 436-110.000.

Klimpl, Fred E., to Koch Engineering Co., Inc. Tile-lined pipe with subdivided tiles therein and methods of production thereof. 4,526,208, Cl. 138-144.000.

Kline, John W.; and Ward, Donald W., to Goodyear Tire & Rubber Company, The. Apparatus for forming a co-extrusion from extruded strips. 4,526,528, Cl. 425-133.500.

Kline, Mark H.: *See*—
Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., 4,527,237, Cl. 364-200.000.

Kling, Alfred: *See*—
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,526,582, Cl. 8-107.000.

Kluckhuhn, Fred H. Load distribution and anti-sag means for luff furling sails. 4,526,122, Cl. 114-106.000.

KMW Aktiebolag: *See*—
Andersson, Karl J. L., 4,526,653, Cl. 162-259.000.

Knapp, Alfons, to Masco Corporation. Handle for a single-control mixer valve and the like. 4,525,894, Cl. 16-111.00R.

Knudsen, David S.; and Knudsen, James D. Machine and process for producing inserts having folded pull tabs. 4,526,562, Cl. 493-80.000.

Knudsen, James D.: *See*—
Knudsen, David S.; and Knudsen, James D., 4,526,562, Cl. 493-80.000.

Knudsen, Soren, to Gerni A/S. Apparatus for cleaning surfaces. 4,526,321, Cl. 239-229.000.

Kobayashi, Hidetoshi: *See*—
Mihayashi, Keiji; Takada, Shunji; and Kobayashi, Hidetoshi, 4,526,863, Cl. 430-505.000.

Kobayashi, Kenichi: *See*—
Matsui, Shougo; Mashima, Yoshimitu; and Kobayashi, Kenichi, 4,527,070, Cl. 250-560.000.

Koch, Dan A.: *See*—
Fleming, Ted D.; Koch, Dan A.; McGill, Francis R.; Powers, Ray P.; and Michaelsen, Roy H., 4,526,318, Cl. 236-49.000.

Koch Engineering Co., Inc.: *See*—
Klimpl, Fred E., 4,526,208, Cl. 138-144.000.

Kocherga, Vladimir K.: *See—*
Alengoz, Anton S.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; and Shevchenko, Jury A., 4,526,758, Cl. 422-122.000.

Kochis, Robert. Dental burr and method of preparing a tooth. 4,526,542, Cl. 433-165.000.

Koenig, Jean-Jacques: *See—*
Jarreau, Francois-Xavier; and Koenig, Jean-Jacques, 4,526,895, Cl. 514-341.000.

Koenig, John F.: *See—*
Boland, James F.; and Koenig, John F., 4,526,136, Cl. 122-451.100.

Koga, Takamasa: *See—*
Kosaka, Takashi; Koga, Takamasa; and Konishi, Kuniyoshi, 4,527,277, Cl. 375-82.000.

Koger, Friedrich; and Haas, Udo, to Wilhelm Gebhardt GmbH. Radial fan with backwardly curving blades. 4,526,506, Cl. 415-98.000.

Koivunen, Timo T.: *See—*
Blomquist, Seppo I.; Saarela, Markku T.; Pouru, Hannu J.; Nyman, Bror G.; Lindroos, Kaj-Henrik; Koivunen, Timo T.; and Fugleberg, Sigmund P., 4,526,650, Cl. 156-642.000.

Kojicic, Bozidar, to Seminole Energy Tools, Inc. Double walled screen-filter with perforated joints. 4,526,230, Cl. 166-236.000.

Kojima, Tamotsu; Miura, Masayoshi; and Oda, Gen, to Matsushita Electric Industrial Company, Limited. Ink supply system for nonimpact printers. 4,527,175, Cl. 346-140.00R.

Kokubu, Kyoichiro: *See—*
Ito, Kathuhiko; Sugii, Hiroshi; Takata, Yukito; and Kokubu, Kyoichiro, 4,526,765, Cl. 423-306.000.

Kokusai Denshin Denwa Co.: *See—*
Yasuda, Yutaka; Hirata, Yasuo; Murakami, Shuji; Nakamura, Katsuhiro; and Furuya, Yukitsuna, 4,527,279, Cl. 375-114.000.

Kolchinsky, Abel E.; and Kazi, Shaukat, to Imperial Clevite Inc. Solenoid valve. 4,526,340, Cl. 251-38.000.

Koll, Eugene A., to Champion International Corporation. Round top rimming machine. 4,526,527, Cl. 425-90.000.

Koller, Paul L.: *See—*
Hideg, Laszlo; Koiler, Paul L.; and Samson, Rogelio G., 4,526,152, Cl. 123-478.000.

Kollross, Gunter. Process and device for production of an end closure on a shirred length of tubular material, especially synthetic casing for sausage manufacture. 4,525,984, Cl. 53-483.000.

Kolodzey, Wolfgang: *See—*
Lusch, Jurgen; Heinen, Heinrich; Lieder, Bernhard; Schmidt, Volkmar; and Kolodzey, Wolfgang, 4,526,588, Cl. 48-202.000.

Komornicki, Jacques: *See—*
Delourme, Raymond; Detienne, Jean-Louis; Komornicki, Jacques; and Tellier, Jacques, 4,526,696, Cl. 252-61.000.

Kondo, Kiyoshi; Takashima, Toshiyuki; and Tunemoto, Daiei, to FMC Corporation. Alkyl 6,6-dimethyl-2-oxo-3-oxabicyclo[3.1.0]hexane-1-carboxylates. 4,526,987, Cl. 549-305.000.

Kondo, Makoto; Nagasaku, Eiichi; Yamamoto, Yuuji; and Taya, Tosiki, to Nippondenso Co., Ltd. Vane compressor. 4,526,524, Cl. 418-255.000.

Kondratenko, Anatoly B.: *See—*
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.

Konig, Hubert: *See—*
Muller, Anton; Konig, Hubert; and Herdeg, Karl, 4,525,900, Cl. 24-68.0CT.

Konishi, Kuniyoshi: *See—*
Kosaka, Takashi; Koga, Takamasa; and Konishi, Kuniyoshi, 4,527,277, Cl. 375-82.000.

Konishi, Masahiro, to Fuji Photo Film Company, Ltd. Electronic camera system. 4,527,205, Cl. 360-35.100.

Konishiroku Photo Industry Co., Ltd.: *See—*
Nishijima, Toyoki; Sasaki, Masao; and Onodera, Kaoru, 4,526,853, Cl. 430-139.000.
Ohta, Tatsuo, 4,526,132, Cl. 118-719.000.
Takada, Shun; Onodera, Kaoru; and Kadowaki, Takashi, 4,526,864, Cl. 430-551.000.
Ura, Hiroaki; and Kato, Shogo, 4,526,358, Cl. 271-34.000.

Konno, Ryozo: *See—*
Ohtsuki, Akira; Konno, Ryozo; Sugai, Makio; Nishimatsu, Masaharu; Kubota, Yuichi; Tanaka, Kazushi; and Shinoura, Osamu, 4,526,837, Cl. 428-425.900.

Kono, Tatsuhiko: *See—*
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,526,894, Cl. 514-312.000.

Kontak Manufacturing Co. Ltd.: *See—*
Wakefield, Donald C., deceased, 4,526,342, Cl. 251-131.000.

Kopinga, Wiert; and Mimmel, Herbert, to U.S. Philips Corporation. Magnet system for an electroacoustic transducer. 4,527,017, Cl. 179-115.5PV.

Korb, Louis L.; and Waitkus, Phillip A., to Plastics Engineering Company. Thermosettable compositions convertible to vitreous carbon and process for preparation thereof. 4,526,924, Cl. 524-541.000.

Korth, Jurgen, to P.A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG. Slide rail assembly for a vehicle seat. 4,526,424, Cl. 297-473.000.

Kosaka, Takashi; Koga, Takamasa; and Konishi, Kuniyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Timing extraction circuit. 4,527,277, Cl. 375-82.000.

Kosarev, Sergei P.: *See—*
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.

Koseki, Shoichiro, to Hitachi, Ltd. False recovery detection circuit for parallel or serial strings of thyristors. 4,527,227, Cl. 363-54.000.

Koshida, Yoshinori: *See—*
Kikuchi, Hiroshi; Tanuma, Jiro; Koshida, Yoshinori; and Itaya, Takashi, 4,526,486, Cl. 400-185.000.

Koslar, Manfred, to Siemens Aktiengesellschaft. Testing device for indicating an electric voltage and its polarity and for continuity testing. 4,527,118, Cl. 324-133.000.

Kosrow, Robert L.; and Yin, Chieh-Kung, to Union Special Corporation. Automatic sleeve making. 4,526,115, Cl. 112-262.300.

Kothe, Norbert; and Eichentopf, Bertram, to Biotest Pharma GmbH. Method of preparing highly purified, stroma-free, non-hepatitic human and animal hemoglobin solutions. 4,526,715, Cl. 260-112.00B.

Koyama, Hiroyasu: *See—*
Takahashi, Toshihiro; Sueda, Noriyoshi; Tsuji, Masahiro; Tahara, Yoshiyuki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Nagase, Masao; and Sugai, Toshiji, 4,526,893, Cl. 514-309.000.

Kozakai, Daisuke; Amano, Toshio; and Nagai, Kunio, to Sony Corporation. Remote control system. 4,527,204, Cl. 360-33.100.

Kraftwerk Union Aktiengesellschaft: *See—*
Fricker, Wolfgang-Peter; and Scholz, Manfred, 4,525,968, Cl. 52-406.000.

Kramer, Steven G. Tamper resistant closure member. 4,526,293, Cl. 221-298.000.

Krauland, Konrad L., Jr. Method and apparatus of producing continuous three-dimensional fabrics. 4,526,026, Cl. 66-1.00R.

Kraus, Charles E., to Excelermatic Inc. Infinitely variable traction roller transmission speed control arrangement. 4,526,051, Cl. 74-200.000.

Krauss-Maffei Aktiengesellschaft: *See—*
Mautner, Franz; Schwarzler, Peter; and Mittermaier, Manfred, 4,526,107, Cl. 105-133.000.

Krauss, Mark J., to American Cord & Webbing Co., Inc. Buckle having improved web securement. 4,525,901, Cl. 24-200.000.

Krauth, Axel: *See—*
Heinrich, Juergen; Schelter, Heinrich; Schindler, Stefan; and Krauth, Axel, 4,526,635, Cl. 156-89.000.

Krawiec, Richard M.: *See—*
Fitzpatrick, Stephen T.; and Krawiec, Richard M., 4,526,946, Cl. 526-202.000.

Kresse, Heinz: *See—*
Hassler, Dieter; Kresse, Heinz; Reichenberger, Helmut; and Naser, Georg, 4,526,168, Cl. 128-303.00R.

Kriebel, Gunter: *See—*
Disteldorf, Josef; zur Hausen, Manfred; Hubel, Werner; and Kriebel, Gunter, 4,526,971, Cl. 546-186.000.

Krikor, Krikor A., to GTE Automatic Electric Inc. Single fault tolerant CCIS data link arrangement. 4,527,157, Cl. 340-825.010.

Krogh, Bjorn, to AGA Aktiebolag. Apparatus for internal cooling in extrusion of tube-shaped objects. 4,526,526, Cl. 425-71.000.

Krogsrud, Harald, to Elkem A/S. Means for cooling a body. 4,526,224, Cl. 165-1.000.

Krohn, Ulrich: *See—*
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,526,824, Cl. 428-35.000.

Kronenberg, Stanley; and Lux, Robert A., to United States of America, Army. Solid state nuclear radiation detector circuit with constant sensitivity. 4,527,063, Cl. 250-370.000.

Krukowski, Blair S. Chain replacement apparatus. 4,525,913, Cl. 29-270.000.

Krull, Joachim, to U.S. Philips Corporation. Ink ribbon cassette provided with an impregnation device. 4,526,488, Cl. 400-202.400.

Kubn, S.A.: *See—*
Werner, Anton; and Gantzer, Jean-Paul, 4,525,987, Cl. 56-15.200.

Kuboki, Shigeo; Kato, Kazuo; and Miyakawa, Nobuaki, to Hitachi, Ltd. Analog-digital converter. 4,527,148, Cl. 340-347.0AD.

Kubota, Kanya; Yamana, Hajimu; and Takeda, Seiichiro, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method for improving ruthenium decontamination efficiency in nitric acid evaporation treatment. 4,526,658, Cl. 203-13.000.

Kubota, Michio; and Shoji, Takeshi, to Nisshin Steel Co., Ltd. Aluminum coated steel support for planographic plate. 4,526,103, Cl. 101-459.000.

Kubota, Yuichi: *See—*
Ohtsuki, Akira; Konno, Ryozo; Sugai, Makio; Nishimatsu, Masaharu; Kubota, Yuichi; Tanaka, Kazushi; and Shinoura, Osamu, 4,526,837, Cl. 428-425.900.

Kudo, Kazuhiko: *See—*
Chino, Koichi; Kudo, Kazuhiko; Oda, Akira; Mura, Hideichi; and Takamura, Yoshiyuki, 4,526,713, Cl. 252-632.000.

Kudo, Koji: *See—*
Takahashi, Kenji; Nagahara, Shusaku; Ozawa, Naoki; Kudo, Koji; and Hirano, Chikafusa, 4,527,200, Cl. 358-213.000.

Kuehnle, Manfred R.; Rose, Robert M.; and Ballas, John S., to Coulter Systems Corporation. Electro-static sheet feeding method and apparatus. 4,526,357, Cl. 271-18.200.

Kuhl, Gunter H.: *See—*
Chu, Pochen; and Kuhl, Gunter H., 4,526,880, Cl. 502-71.000.

Kuhnert, Gottfried; and Lutz, Albert, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG. Knitting cam unit and transfer cam unit combination for V-bed flat knitting machines with slider needles. 4,526,018, Cl. 66-78.000.

Kulesh, Vladimir P.: *See—*
Bykov, Anatoly P.; Orlov, Anatoly A.; Gribanov, Dmitry D.; Kulesh, Vladimir P.; Fonov, Sergei D.; Egorov, Vitaly V.; Moskalik, Leonid M.; Martynov, Apollinary K.; and Ryadchikov, Vladimir E., 4,526,471, Cl. 356-373.000.

Kuljis, Zoran: *See—*
Wentzell, Timothy H.; and Kuljis, Zoran, 4,526,037, Cl. 73-640.000.

Kumagai, Takashi: *See—*
Sato, Kazuhiro; Kumagai, Takashi; Ishizuka, Takuo; and Ishizuka, Tadatsugu, 4,527,253, Cl. 364-900.000.

Kumahara, Katsumi: *See—*
Chiba, Hiromasa; Harada, Takakiyo; Kumahara, Katsumi; Kawazoe, Shunji; and Sato, Akihiro, 4,526,931, Cl. 525-268.000.

Kumura, Haruyoshi: *See—*
Tanaka, Yoshikazu; Hirano, Hiroyuki; Abo, Keiju; Kumura, Haruyoshi; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,526,557, Cl. 474-18.000.

Kunimi, Hitoshi: *See—*
Yoshimoto, Teruko; Kawai, Mikio; and Kunimi, Hitoshi, 4,526,659, Cl. 204-56.00R.

Kunimoto, Etsuo: *See—*
Tateishi, Mataji; Kunimoto, Etsuo; and Takaishi, Tatsuo, 4,526,151, Cl. 123-468.000.

Kunkel, Lorenz V.: *See—*
Palm, John W.; and Kunkel, Lorenz V., 4,526,590, Cl. 55-27.000.

Kuroda, Muthmi; Murata, Moriyasu; Takeda, Tsunesi; and Tamura, Junich, to Kao Corporation. Bleaching detergent composition comprises coated sodium percarbonate particles. 4,526,698, Cl. 252-99.000.

Kurokawa, Koshiro: *See—*
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,527,174, Cl. 346-136.000.
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,527,176, Cl. 346-141.000.

Kurosawa, Ryoichi, to Tokyo Shibaura Denki Kabushiki Kaisha. System for converting mechanical movement to a digital signal. 4,527,120, Cl. 324-166.000.

Kutsuwa, Yoshikazu; Kitahara, Kouji; and Ishii, Toshiyuki, to Du Pont-Mitsui Polychemicals Co., Ltd. Semiconducting compositions and wires and cables using the same. 4,526,707, Cl. 252-511.000.

Kverneland A/S: *See—*
Skjaeveland, Magne, 4,526,237, Cl. 172-647.000.

Kvitash, Vadim I. Balascopy method for detecting and rapidly evaluating multiple imbalances within multi-parametric systems. 4,527,240, Cl. 364-415.000.

Kyle Welding & Machine Shop Ltd.: *See—*
Jacobsen, Ralph O., 4,526,236, Cl. 172-126.000.

Kyriss, Karl M.: *See—*
Yohe, Thomas L.; and Kyriss, Karl M., 4,526,692, Cl. 210-747.000.

Kysor Industrial Corporation: *See—*
Monigold, Larry E.; and Lewis, Ordale, 4,526,140, Cl. 123-41.150.

L.B. Plastics Limited: *See—*
Litchfield, Leon G.; and Hardy, Terence, 4,525,966, Cl. 52-397.000.

L.K. Tool Company Limited: *See—*
Bury, James, 4,525,930, Cl. 33-1.00M.

L. Payen and Cie, S.A.: *See—*
Payen, Pierre, 4,525,992, Cl. 57-18.000.

La Telemecanique Electrique: *See—*
Aucel, Jean-Claude; and Testud, Jean-Louis, 4,527,231, Cl. 364-149.000.

Laapotti, Jorma: *See—*
Karvinen, Mikko; and Laapotti, Jorma, 4,526,655, Cl. 162-360.100.

La Barge, Robert L.; Scherf, Thomas W.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Pohlenz, Elmer E., to Aluminum Company of America. Apparatus for processing used containers having improved crusher means. 4,526,096, Cl. 100-53.000.

LaBate, Michael D. Slag and hot metal runner system. 4,526,351, Cl. 266-196.000.

Labbe, Francis A. M., to Molins plc. Cigarette making machines. 4,526,182, Cl. 131-109.100.

Lacour, Alain P.: *See—*
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,526,786, Cl. 514-240.000.

Lai, Juh M. Structure of lock for electric supplying switch. 4,527,024, Cl. 200-11.00C.

Laing, Ingeborg: *See—*
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,526,005, Cl. 60-659.000.

Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver: Long-period thermal storage accumulators. 4,526,005, Cl. 60-659.000.

Laing, Oliver: *See—*
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,526,005, Cl. 60-659.000.

L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude: *See—*
Cuny, Francis; and Auzary, Louis, 4,527,038, Cl. 219-75.000.

Lajos, Robert: *See—*
Tanielian, Minas; Blackstone, Scott; and Lajos, Robert, 4,526,665, Cl. 204-192.00C.

Lake, Harold: *See—*
Hallee, Donald O.; Lake, Harold; Johansson, Kenneth L.; and Graves, Thomas B., 4,527,271, Cl. 371-20.000.

Lake, Leo C., Jr., to Yamaha Motor Corporation, U.S.A. Unleaded fuel filling system for tanks without inlet pipe. 4,526,216, Cl. 141-348.000.

Laman, Robert R.: *See—*
Caplan, Jerome S.; Delmege, James W.; Laman, Robert R.; and Navarro, Christine, 4,527,012, Cl. 179-18.0ES.

Lamb, Steve R.: *See—*
Moore, Robert R.; and Lamb, Steve R., 4,526,355, Cl. 269-328.000.

Lammers, Arend J. W.: *See—*
Has, Peter V.; and Lammers, Arend J. W., 4,527,026, Cl. 200-78.000.

Lane, Joseph J.; and Scanland, Joseph E., to Roper Corporation. Floating foot shield for walk-behind mower with sulky. 4,525,989, Cl. 56-17.400.

Langenbacher, Helmut: *See—*
Hess, Dieter; and Langenbacher, Helmut, 4,525,934, Cl. 34-10.000.

Langer, Heimo J.: *See—*
Dunnavant, William R.; Langer, Heimo J.; and Sedgwick, Grant O., 4,526,219, Cl. 164-16.000.

Langlois, Michel: *See—*
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,526,786, Cl. 514-240.000.

Lanner, Helmut F., to Sjolin, Conny. Profile rail for the fastening of flexible sheet-like structures. 4,526,218, Cl. 160-374.100.

Lapp, Theodore R.: *See—*
Kaiser, Fredrick P.; and Lapp, Theodore R., 4,527,247, Cl. 364-550.000.

Larsen, Erik A. Drive mechanism for a lapping machine or the like. 4,525,954, Cl. 51-58.000.

Larsen, Raymond D.: *See—*
Lawrence, Larry D.; Sudweeks, Walter B.; and Larsen, Raymond D., 4,526,633, Cl. 149-109.600.

Laskaris, Evangelos T., to General Electric Company. Support for cryostat penetration tube. 4,526,015, Cl. 62-514.00R.

Latta, Ernst-Eberhard; and Ronay, Maria, to International Business Machines Corporation. Catalytic oxidation of solid materials. 4,526,629, Cl. 148-1.500.

Lau, Jark C., to Kimberly-Clark Corporation. Meltblown die and method. 4,526,733, Cl. 264-12.000.

Lawrence, Larry D.; Sudweeks, Walter B.; and Larsen, Raymond D., to IRECO Incorporated. Formulating and delivery system for emulsion blasting. 4,526,633, Cl. 149-109.600.

Leach, Roger W.: *See—*
Brauer, Larry F.; and Leach, Roger W., 4,526,104, Cl. 102-228.000.

Lee, Hyo C.: *See—*
Beshty, Bahjat S.; Hatfield, W. Robert; Lee, Hyo C.; Heck, Ronald M.; and Hsiung, Thomas H., 4,526,614, Cl. 75-83.000.

Lee, James F. Portable barbecue system. 4,526,158, Cl. 126-9.00R.

Lee, Shy-Fuh, to Zoecon Corporation. Certain 2-pyridyloxyphenyl-oximino-ether-carboxylates, herbicidal compositions containing same and their herbicidal method of use. 4,526,608, Cl. 71-94.000.

Leftault, Charles J., Jr.: *See—*
La Barge, Robert L.; Scherf, Thomas W.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Pohlenz, Elmer E., 4,526,096, Cl. 100-53.000.

Leggett & Platt, Incorporated: *See—*
Franz, Leo J., 4,526,110, Cl. 108-108.000.

Legille, Edouard; Bernard, Gilbert; Cimenti, Giovanni; and Thillen, Guy, to Paul Wurth S.A. Cooling apparatus for use in conjunction with a charging device for a shaft furnace. 4,526,536, Cl. 432-238.000.

Lehman, Richard L.; and Manring, William H., to FMC Corporation. Method for manufacturing an opal borosilicate glass. 4,526,603, Cl. 65-136.000.

Leiber, Heinz, to Robert Bosch GmbH. Master brake cylinder for two-circuit braking systems. 4,526,003, Cl. 60-534.000.

Leiber, Heinz, to Robert Bosch GmbH. Electromagnetic valve. 4,526,203, Cl. 137-627.500.

Leine, Lars: *See—*
Borrman, Bo; Leine, Lars; Nylund, Olov; and Ode, Bengt, 4,526,744, Cl. 376-440.000.

Leining, Lyndon R.; Bliese, Rodger W.; and White, Gordon G., to Geo. A. Hormel & Company. Pork shoulder or ham slasher apparatus. 4,525,896, Cl. 17-1.00R.

LeMert, Alfred J. Cymbal mounting fixture. 4,526,083, Cl. 84-421.000.

Lemke, Kenneth W.; and McNeil, Maynard W., to M&T Chemicals Inc. Quaternary aminehydroxypropane sulfobetaines. 4,526,968, Cl. 546-139.000.

Le Moigne, Jacques: *See—*
Fouletier, Mireille; Siebert, Elisabeth; and Le Moigne, Jacques, 4,526,674, Cl. 204-426.000.

Lemp, William M. Microphone hanger. 4,527,019, Cl. 179-146.00R.

Lenahan, Dean T.: *See—*
Gay, Charles H., Jr.; and Lenahan, Dean T., 4,526,509, Cl. 415-174.000.

Lermer Apparatebau GmbH: *See—*
Schmidt, Hubert, 4,526,253, Cl. 188-1.120.

Leroy, Andre R.; and Flamme, Jean-Marie G. Windscreen wiper system. 4,525,891, Cl. 15-250.230.

Le Roy, Pierre: *See—*
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,526,962, Cl. 544-016.000.

Leslie, Elmer N.: *See—*
Martell, Charles R.; Leslie, Elmer N.; and Treadwell, Stephen S., 4,526,114, Cl. 112-262.100.

Lester, Graham G.; Brand, Peter J.; and Deane, Graham, to Smiths Industries Public Limited Company. Suction-irrigation equipment with control valve. 4,526,573, Cl. 604-33.000.

Levasseur, Joseph L., to H. R. Electronics Company. Lock-ahead vend control employing a common vend energization monitor to effect vend selection recognition for vending. 4,526,263, Cl. 194-1.00N.

Lever Brothers Company: *See—*
Boskamp, Jelles V.; and Mohlmann, Willem M. M., 4,526,709, Cl. 252-527.000.
Rubin, Fred K., 4,526,701, Cl. 252-113.000.

Levine, Richard, to United Technologies Corporation. Attachment for TOBI. 4,526,511, Cl. 416-95.000.

Lewarchik, Ronald J.; Murray, Kevin P.; Donovan, Marcella G.; and Jones, Arthur T., to DeSoto, Inc. Thermosetting coating compositions for the sealing of fiber reinforced plastics. 4,526,939, Cl. 525-438.000.

Lewing, Douglas S.: *See—*
Pepper, Roger T.; Nelson, Daniel C.; and Lewing, Douglas S., 4,526,770, Cl. 423-447.400.

Lewis, Henry G., Jr., to RCA Corporation. Apparatus for demodulating sampled data chroma signals. 4,527,188, Cl. 358-23.000.

Lewis, James M.; Owens, Robert A.; Sweeney, Richard F.; Wake, Ronald W.; and Rinehart, Robert E., to Allied Corporation. Low striation positive diazoketone resist composition with cyclic ketone(s) and aliphatic alcohol as solvents. 4,526,856, Cl. 430-191.000.

Lewis, Ordale: *See—*
Monigold, Larry E.; and Lewis, Ordale, 4,526,140, Cl. 123-41.150.

LFE Corporation: *See—*
Hajj, John G., 4,526,670, Cl. 204-298.000.

Libow, Mitchell. Wrapping and sealing apparatus. 4,525,983, Cl. 53-463.000.

Liebel, John T., Jr.: *See—*
Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., 4,527,237, Cl. 364-200.000.

Lieder, Bernhard: *See—*
Lusch, Jurgen; Heinen, Heinrich; Lieder, Bernhard; Schmidt, Volkmar; and Kolodzey, Wolfgang, 4,526,588, Cl. 48-202.000.

Lim, Wah L.: *See—*
Egli, Werner H.; Lim, Wah L.; and Weber, Mark W., 4,526,469, Cl. 356-350.000.

Lin, Jiang-Jen; and Sanderson, John R., to Texaco, Inc. Synthesis of substituted dioxolanes by direct oxidation of olefins over molybdenum 8-hydroxyquinoline. 4,526,992, Cl. 549-430.000.

Lin, Philip C.; and Ho, James S., to United States of America, Environmental Protection Agency. Automatic bottle sealing mechanism for liquid sampling apparatus. 4,525,979, Cl. 53-268.000.

Lindauer Dornier Gesellschaft mbH: *See—*
Tovenrath, Claus; and Windischbauer, Florian, 4,525,906, Cl. 28-205.000.

Linde Aktiengesellschaft: *See—*
Weber, Gunter, 4,526,773, Cl. 423-573.00R.

Lindner, Edmund: *See—*
Jung, Norbert; Lindner, Edmund; and Lohrbaecher, Volker, 4,526,286, Cl. 220-22.000.

Lindroos, Kaj-Henrik: *See—*
Blomquist, Seppo I.; Saarela, Markku T.; Pouru, Hannu J.; Nyman, Bror G.; Lindroos, Kaj-Henrik; Koivunen, Timo T.; and Fugleberg, Sigmund P., 4,526,650, Cl. 156-642.000.

Lindsay Specialty Products Limited: *See—*
Miladinovic, Milorad, 4,527,167, Cl. 343-840.000.

Linear Films, Inc.: *See—*
Hummel, John E.; and Baab, William E., 4,526,565, Cl. 493-196.000.

Ling, Andrew T.: *See—*
Donohue, James M.; and Ling, Andrew T., 4,527,252, Cl. 364-900.000.

Link, Donald A.; Swessel, John A., Jr.; and Theisen, Peter J., to Eaton Corporation. Molded case circuit breaker with improved high fault current interruption capability. 4,527,027, Cl. 200-144.00R.

Linschitz, Henry: *See—*
Perlman, Daniel; and Linschitz, Henry, 4,526,752, Cl. 422-56.000.

Lippman, Jerry: *See—*
Ferziger, Daniel; and Lippman, Jerry, 4,526,830, Cl. 428-268.000.

Litchfield, Leon G.; and Hardy, Terence, to L.B. Plastics Limited. Window systems. 4,525,966, Cl. 52-397.000.

Little, Ralph V. Wetting agent injection system. 4,526,234, Cl. 169-15.000.

Little, Roger G.; and Shanfield, Stanley R., to Spire Corporation. Coating method. 4,526,673, Cl. 204-192.00E.

Litton Research Systems, Inc.: *See—*
Williams, Shandton D., 4,526,430, Cl. 339-45.00M.

Littwin, Burkhard: *See—*
Geffcken, Walter; and Littwin, Burkhard, 4,527,100, Cl. 315-366.000.

Litzinger, Ronald L., to Texaco Inc. Removal of low melting particles from unground coal liquefaction residue. 4,526,679, Cl. 209-3.000.

Livingston, Arnold M., to Tifa Limited. Mobile firefighter training equipment. 4,526,548, Cl. 434-226.000.

Livingston, James J., to Polaroid Corporation. Method of and system for controlling edge of distributed processing fluid. 4,526,455, Cl. 354-298.000.

Livingston, James J., to Polaroid Corporation. Applicator for oxidizable fluid. 4,526,456, Cl. 354-317.000.

Lloyd, Isabel K.: *See—*
Yoldas, Bulent E.; and Lloyd, Isabel K., 4,526,844, Cl. 429-30.000.

Lloyd Matheson, Inc.: *See—*
Fieldhouse, Raymond, 4,526,498, Cl. 409-82.000.

Locher, Johannes: *See—*
Fischer, Werner; Flaig, Ulrich; Hettich, Gerhard; and Locher, Johannes, 4,527,121, Cl. 324-207.000.

Lockheed Corporation: *See—*
Cronin, Michael J.; and Hamra, Victor W., 4,526,432, Cl. 339-75.00M.

Loctite Corporation: *See—*
Jialanella, Gary L., 4,526,811, Cl. 427-108.000.

Logan, Max C.; and Nordstrom, Jon T., to Control Data Corporation. Dew point sensitive computer cooling system. 4,526,011, Cl. 62-176.100.

Lohrbaecher, Volker: *See—*
Jung, Norbert; Lindner, Edmund; and Lohrbaecher, Volker, 4,526,286, Cl. 220-22.000.

LoMaglio, F. Leo, to Schroer Manufacturing Co., Inc. Animal isolation cage ward. 4,526,133, Cl. 119-17.000.

Long, Barry W., to Goodyear Tire & Rubber Company, The. Method of making conveyor belt. 4,526,637, Cl. 156-137.000.

Long, William A.: *See—*
Brennan, Edward J.; Long, William A.; and Brunelle, Rene J., 4,526,421, Cl. 297-232.000.

Lonn, Albert H. R.: *See—*
Guyton, Peter F.; and Lonn, Albert H. R., 4,527,057, Cl. 250-252.100.

Loose, Peter W. Crop shear control. 4,527,243, Cl. 364-469.000.

Loughran, James A.: *See—*
Anthony, Thomas R.; Houston, Douglas E.; and Loughran, James A., 4,527,183, Cl. 357-30.000.

Loughridge, Fred: *See—*
Bouchard, Andre C.; Maya, Jakob; Loughridge, Fred; Andress, Charles W.; and Wierzbicki, Julian, 4,527,088, Cl. 313-493.000.

Lowe, Henry E., Jr. Musical hat, cap or similar head covering. 4,525,878, Cl. 2-185.00R.

Lubrizol Corporation, The: *See—*
Grava, Arturs, 4,526,950, Cl. 526-272.000.

Lucas Industries: *See—*
Mowbray, Dorian F.; and Potter, James C., 4,526,519, Cl. 417-490.000.

Lucast, Donald H.; Shubkin, Ronald L.; Filbey, Allen H.; and Wollensak, John C., to Ethyl Corporation. Polyurethanes from dialkyl diaminobenzenes and processes therefor. 4,526,905, Cl. 521-51.000.

Luccarelli, Domenick, Jr.; Mookherjee, Braja D.; Wilson, Richard A.; Zampino, Michael J.; and Bowen, David R., to International Flavors & Fragrances Inc. Mixtures of one or more C_4–C_{10}-n-alkanoic acids with the ethyl ester of 2-hydroxy-4-methyl pentanoic acid. 4,526,798, Cl. 426-534.000.

Luchaco, David G.: *See—*
Capewell, Dennis; Luchaco, David G.; and Spira, Joel S., 4,527,099, Cl. 315-291.000.

Luchko, Viktor N.: *See—*
Alengoz, Anton S.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; and Shevchenko, Jury A., 4,526,758, Cl. 422-122.000.

Luder, Rainer: *See—*
Haussmann, Wolfgang; and Luder, Rainer, 4,527,145, Cl. 358-19.000.

Luehring, Elmer L., to Joslyn Mfg. and Supply Co. Modular vacuum interrupter. 4,527,028, Cl. 200-144.00B.

Luk Lamellen und Kupplungsbau GmbH: *See—*
Huber, Lothar, 4,526,258, Cl. 192-88.00A.
Maier, Peter; and Frietsch, Kurt, 4,526,261, Cl. 192-106.200.

Lukens General Industries, Inc.: *See—*
Spencer, Kenneth E.; and Schmitt, Dallas L., 4,526,108, Cl. 105-182.00E.

Lukens, James E.; and Mankiewich, Paul M., to United States of America, Navy. Method for fabricating superconducting weak-links using electron beam lithography. 4,526,858, Cl. 430-296.000.

Luly, Robert A. Lightweight folding parabolic reflector and antenna system. 4,527,166, Cl. 343-840.000.

Lundberg, Jan A.; and Fransson, Rolf G., to Victor Hasselblad Aktiebolag. Fastening device for interchangeable projection lens. 4,526,440, Cl. 350-257.000.

Lundberg, Robert D.; and Weiss, Robert A., to Exxon Research & Engineering Company. Polymeric compositions of co- and terpolymers. 4,526,951, Cl. 526-240.000.

Lunden, Bengt; and Pettersson, Tord. Procedure and device for the application of a label to an article. 4,526,310, Cl. 227-67.000.

Lupoli, Peter J.: *See—*
Comerford, John J.; and Lupoli, Peter J., 4,527,048, Cl. 219-269.000.

Lurito, Don J. Combination system and question and answer matching game. 4,526,550, Cl. 434-340.000.

Lusch, Jurgen; Heinen, Heinrich; Lieder, Bernhard; Schmidt, Volkmar; and Kolodzey, Wolfgang, to Ruhrchemie Aktiengesellschaft. Process for the production of a coal-water suspension which is suitable for use in coal gasification under elevated pressure. 4,526,588, Cl. 48-202.000.

Lutron Electronics Co., Inc.: *See*—
Capewell, Dennis; Luchaco, David G.; and Spira, Joel S., 4,527,099, Cl. 315-291.000.

Lutteke, Georg, to U.S. Philips Corporation. Push-pull microwave oscillator with fundamental and second harmonic outputs. 4,527,130, Cl. 331-36.00C.

Lutz, Albert: *See*—
Kuhnert, Gottfried; and Lutz, Albert, 4,526,018, Cl. 66-78.000.

Lux, Robert A.: *See*—
Kronenberg, Stanley; and Lux, Robert A., 4,527,063, Cl. 250-370.000.

Lykes, Norman R. Apparatus for manually distributing powder granules. 4,526,305, Cl. 222-632.000.

M&D International Enterprises, Inc.: *See*—
Mease, Richard B.; and Burridge, Robert E., 4,526,457, Cl. 354-345.000.

M&T Chemicals Inc.: *See*—
Lemke, Kenneth W.; and McNeil, Maynard W., 4,526,968, Cl. 546-139.000.

Maas, Edward T., Jr.; and Kalina, Davida W., to Standard Oil Company (Indiana). Separation of hydrogen sulfide from gaseous and non-aqueous liquid streams. 4,526,774, Cl. 423-573.00R.

MacGregor Sporting Goods, Inc.: *See*—
Tomczak, Walter F., 4,525,875, Cl. 2-2.000.

Machaj, Daniel F.: *See*—
Niemiro, Thaddeus A.; and Machaj, Daniel F., 4,526,099, Cl. 101-220.000.

MacMichael, Donald B. A.: *See*—
Harrison, William J.; Reynolds, Andrew J.; Kellaway, Michael J.; MacMichael, Donald B. A.; and Miller, Anne T., 4,526,215, Cl. 141-83.000.

MacNamara, Barry A.; and Garde, John H. Electrically operated card dispenser. 4,526,264, Cl. 194-1.00N.

Mader, Gerald J. Method of repairing breaks in sheet material. 4,526,636, Cl. 156-94.000.

Maebayashi, Jiro: *See*—
Kijima, Takao; and Maebayashi, Jiro, 4,526,400, Cl. 280-701.000.

Maeda, Muneyoshi; Endo, Kazuyuki; and Tansei, Hikaru, to Bridgestone Tire Company Limited. Heavy duty pneumatic radial tires. 4,526,217, Cl. 152-527.000.

Maekawara, Hideaki: *See*—
Yoshizawa, Akinori; Nakane, Yasuo; Hagimori, Kenji; Ohgai, Koya; Arisawa, Norisada; Takahashi, Tadashi; Maekawara, Hideaki; Imaizumi, Hiroyuki; Tsuchida, Hideyuki; Mieno, Eiichirou; and Sugino, Kenji, 4,526,611, Cl. 75-0.50B.

Mag Instrument, Inc.: *See*—
Maglica, Anthony, 4,527,223, Cl. 362-187.000.

Maglica, Anthony, to Mag Instrument, Inc. Flashlight. 4,527,223, Cl. 362-187.000.

Magnus, George; Smith, Norman; and Keyes, Bonnie, to Stepan Company. Polyol blends of phthalate/trimellitate esters for polyurethane-polyisocyanurate foams. 4,526,908, Cl. 521-172.000.

Maher, Elizabeth A.: *See*—
Tsou, Dean T.; Burrington, James D.; Maher, Elizabeth A.; and Grassell, Robert K., 4,526,884, Cl. 502-154.000.

Mahoney, John A.; Pellet, Regis J.; and Helstrom, John J., to Standard Oil Company (Indiana). Hydrocarbon conversion method. 4,526,675, Cl. 208-10.000.

Maier, Peter; and Frietsch, Kurt, to Luk Lamellen und Kupplungsbau GmbH. Clutch plate with control means and at least two energy storing devices cooperating with the control means. 4,526,261, Cl. 192-106.200.

Maier, Robert L., to McCormick Morgan, Inc. Flexible conduit take-up apparatus. 4,526,090, Cl. 98-33.100.

Maillard, Claude M. J.: *See*—
d'Agostino, Guy; Dhainaut, Andre; and Maillard, Claude M. J., 4,526,087, Cl. 91-61.000.

Majestic, Peter J., to Corning Glass Works. Wire electrical discharge machine flushing process and apparatus. 4,527,035, Cl. 219-69.00W.

Makino, Yuzi: *See*—
Hasegawa, Shumpei; and Makino, Yuzi, 4,526,144, Cl. 123-339.000.

Makuta, Shunichi, to Rhythm Watch Company Limited. Electronic sound generating circuit for generation bell toll. 4,526,478, Cl. 368-273.000.

Malcolm, Bruce, to Garrett Corporation, The. Inflatable evacuation slide. 4,526,262, Cl. 193-25.00B.

Mally, Timothy G.; and Stengel, Bruce W., to Oscar Mayer Foods Corporation. Fast retract feed. 4,526,505, Cl. 414-750.000.

Malthouse, Martin D.; and Groeger, Heinz K., to Associated Packaging Equipment Corp. Ltd. Labelling equipment. 4,526,645, Cl. 156-350.000.

Mangia, Alberto: *See*—
Giobbio, Vincenzo; Ornato, Giorgio; Buracchi, Livio; and Mangia, Alberto, 4,526,985, Cl. 549-253.000.

Manhoff, Louis J., Jr. Screw holding device. 4,526,072, Cl. 81-451.000.

Mankey, Harry S.: *See*—
Oswald, Norman D.; Dean, Robert R.; and Mankey, Harry S., 4,526,344, Cl. 254-9.00C.

Mankiewich, Paul M.: *See*—
Lukens, James E.; and Mankiewich, Paul M., 4,526,858, Cl. 430-296.000.

Mannel, Friedrich, to GVT Gesellschaft fur Verfahrenstechnik der garnverarbeitenden Industrie mbH. Method and arrangement to control an automatic embroidery machine. 4,526,116, Cl. 112-266.100.

Mannes, Paul M. Clamping system. 4,526,354, Cl. 269-93.000.

Manring, William H.: *See*—
Lehman, Richard L.; and Manring, William H., 4,526,603, Cl. 65-136.000.

Manto, Charles L., to Manto Incorporated. Information storer and retriever. 4,527,262, Cl. 369-33.000.

Manto Incorporated: *See*—
Manto, Charles L., 4,527,262, Cl. 369-33.000.

Manville Service Corporation: *See*—
Dolin, Rick L., 4,526,914, Cl. 524-42.000.

Manzke, Klaus: *See*—
Grittmann, Ernst-Juergen; Weis, Hans-Joachim; and Manzke, Klaus, 4,527,211, Cl. 360-109.000.

MAPA GmbH Gummi-und Plastikwerke: *See*—
Kesselring, Lutz; and Frodrich, Horst, 4,526,274, Cl. 206-231.000.

Marantz, Daniel R.: *See*—
Herman, Herbert; and Marantz, Daniel R., 4,526,839, Cl. 428-550.000.

Marathon Oil Company: *See*—
Bryan, Larry E.; Grove, Richard W.; and Primus, William F., 4,525,914, Cl. 29-402.080.

Margerum, David E.: *See*—
Young, Russel L.; and Margerum, David E., 4,527,032, Cl. 219-10.61R.

Margolis, Anatoly E.: *See*—
Alengoz, Anton S.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; and Shevchenko, Jury A., 4,526,758, Cl. 422-122.000.

Margoshes, Marvin: *See*—
Burns, Donald A.; Margoshes, Marvin; and Cassaday, Michael M., 4,526,754, Cl. 422-82.000.

Margulies, Herman, to Sterling Drug Inc. Dispensing package for containing and dispensing articles. 4,526,291, Cl. 221-63.000.

Maricle, Donald L.: *See*—
Reiser, Carl A.; and Maricle, Donald L., 4,526,845, Cl. 429-41.000.

Marien, Pieter: *See*—
Boersma, Rintje; van Wijnandsbergen, Marius F. F.; Irik, Gijsbert W.; and Marien, Pieter, 4,527,220, Cl. 361-332.000.

Marine Construction & Design Co.: *See*—
Furlong, Donn B., 4,525,947, Cl. 43-4.000.

Mark, Victor, to General Electric Company. Copolyester-carbonates exhibiting improved processability. 4,526,956, Cl. 528-176.000.

Marker International: *See*—
Sedlmair, Gerhard, 4,526,398, Cl. 280-615.000.

Marker International Company: *See*—
Richert, Manfred, 4,526,397, Cl. 280-612.000.

Marmonier, Andre : *See*—
Borne, Andre ; Marmonier, Andre ; and Ruiz, Ariel, 4,526,435, Cl. 339-103.00C.

Marschner, Frank W.; Kenkare, Divaker B.; and Bowers, James H., to Colgate-Palmolive Company. Anhydrous antiperspirant composition. 4,526,780, Cl. 424-66.000.

Marshall, Charles R., to Dixon Industries Corporation. One-piece sealing ring for a shaft. 4,526,388, Cl. 277-206.000.

Martela OY: *See*—
Rantakari, Pekka, 4,526,334, Cl. 248-157.000.

Martell, Charles R.; Leslie, Elmer N.; and Treadwell, Stephen S., to Microdynamics, Inc. Method and apparatus for sewing mitered corners on a split needle bar sewing machine. 4,526,114, Cl. 112-262.100.

Marthoz, Roger: *See*—
Harding, Antony; and Marthoz, Roger, 4,526,267, Cl. 198-409.000.

Martin, John C.; and Martin, Paul, to Diesel Equipment Limited. Pneumatic valve. 4,526,197, Cl. 137-596.200.

Martin, John C., to Diesel Equipment Limited. Truck floor board construction. 4,526,418, Cl. 296-182.000.

Martin, Lawrence L.; and Setescak, Linda L., to Hoechst Roussel Pharmaceuticals Inc. Substituted alkyl amine derivatives of 6,11-dihydro-11-oxodibenz[b,e]oxepins. 4,526,891, Cl. 514-253.000.

Martin Marietta Aluminum Inc.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,526,911, Cl. 523-445.000.

Martin, Paul: *See*—
Martin, John C.; and Martin, Paul, 4,526,197, Cl. 137-596.200.

Martinez, Arthur T., to T.A.D. Avanti, Inc. Cassette ejector mechanism. 4,527,209, Cl. 360-96.500.

Martinez, Federico. Weighing dividing machines. 4,526,213, Cl. 141-18.000.

Martynov, Apollinary K.: *See*—
Bykov, Anatoly P.; Orlov, Anatoly A.; Gribanov, Dmitry D.; Kulesh, Vladimir P.; Fonov, Sergei D.; Egorov, Vitaly V.; Moskalik, Leonid M.; Martynov, Apollinary K.; and Ryadchikov, Vladimir E., 4,526,471, Cl. 356-373.000.

Marvin Glass & Associates: *See*—
Rosenwinkel, Donald A.; Breslow, Jeffrey D.; and Zaruba, John V., 4,526,376, Cl. 273-249.000.

Masco Corporation: *See*—
Knapp, Alfons, 4,525,894, Cl. 16-111.00R.

Mashima, Yoshimitu: *See*—
Matsui, Shougo; Mashima, Yoshimitu; and Kobayashi, Kenichi, 4,527,070, Cl. 250-560.000.

Massachusetts Institute of Technology: *See*—
Clark, John I.; Mengel, Loretta S.; and Benedek, George B., 4,526,789, Cl. 514-627.000.

Massey-Ferguson Services N.V.: *See—*
Batchelor, Frederick H.; and Brown, David J., 4,526,055, Cl. 74-471.0XY.

Masson, Vijay, to Heat-Timer Corporation. Hot water heating system control device. 4,527,246, Cl. 364-505.000.

Mastrocola, Antonietta R.: *See—*
Adger, Brian M.; and Mastrocola, Antonietta R., 4,526,974, Cl. 546-329.000.

Masuko, Seiichi: *See—*
Okada, Hiroshi; Itagaki, Hideyuki; Kano, Takehiko; and Masuko, Seiichi, 4,526,656, Cl. 202-158.000.

Mateja, Edward J.: *See—*
Beller, Wilbert E.; and Mateja, Edward J., 4,526,041, Cl. 73-861.470.

Material Sciences Corporation: *See—*
Rausch, John J.; and Novy, Russell F., 4,526,817, Cl. 427-431.000.

Mathieu, Daniel: *See—*
Auchapt, Pierre; and Mathieu, Daniel, 4,526,035, Cl. 73-439.000.

Mathieu, Hans; and Hochstrasser, Jurgen, to Hochstrasser geb. Wack, Elisabeth; and Hochstrasser, Jurgen. Drilling device. 4,526,242, Cl. 175-94.000.

Mathumoto, Shigemi; and Nagoshi, Fumiya, to Kanegafuchi Kagaku Kogyo Kabushiki. α-Methylstyrene high-content copolymers, a process for their production and thermoplastic resin compositions containing α-methylstyrene high-content copolymers blended with graft copolymers. 4,526,928, Cl. 525-76.000.

Matson, Charles L.: *See—*
Wood, Roger W.; and Matson, Charles L., 4,527,269, Cl. 371-3.000.

Matsubara, Naoki, to Oval Engineering Co., Ltd. Oscillation compensating apparatus for vortex flow meter. 4,526,040, Cl. 73-861.240.

Matsucka, Hiroyoshi: *See—*
Yoshida, Mitsuo; Matsucka, Hiroyoshi; and Munekuni, Hajime, 4,526,663, Cl. 204-98.000.

Matsuda, Shoji: *See—*
Nakagawa, Yoshinori; Yoneda, Tsutomu; and Matsuda, Shoji, 4,526,570, Cl. 604-20.000.

Matsui, Shougo; Mashima, Yoshimitu; and Kobayashi, Kenichi, to Fujitsu Limited. Method and apparatus for inspecting a pattern. 4,527,070, Cl. 250-560.000.

Matsumoto, Michito: *See—*
Kakii, Toshiaki; Toda, Yuichi; Matsuno, Koichiro; Usui, Yuichi; and Matsumoto, Michito, 4,526,732, Cl. 264-2.700.

Matsumoto, Tadayuki: *See—*
Miyoshi, Takehiko; Matsumoto, Tadayuki; and Sano, Keizo, 4,526,738, Cl. 264-176.00F.

Matsumoto, Yoshio: *See—*
Igarashi, Kimizo; Takigawa, Katsumi; Muchi, Tsuneo; Matsumoto, Yoshio; Ueno, Kiichi; and Ohkoshi, Akio, 4,526,601, Cl. 65-59.100.

Matsuno, Koichiro: *See—*
Kakii, Toshiaki; Toda, Yuichi; Matsuno, Koichiro; Usui, Yuichi; and Matsumoto, Michito, 4,526,732, Cl. 264-2.700.

Matsuo, Kenji; and Takata, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Signal level comparing circuit. 4,527,076, Cl. 307-362.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Gotou, Makoto, 4,527,102, Cl. 318-254.000.
Kojima, Tamotsu; Miura, Masayoshi; and Oda, Gen, 4,527,175, Cl. 346-140.00R.
Tanaka, Kazuyuki, 4,527,154, Cl. 340-221.000.

Matsuura, Hideki: *See—*
Yamazoe, Hisamitsu; Matsuura, Hideki; Ito, Katsunori; and Ohba, Masahiro, 4,526,042, Cl. 75-861.750.

Matsuura, Hideo: *See—*
Hibi, Yasumori; and Matsuura, Hideo, 4,527,273, Cl. 371-38.000.

Matsuyama, Junya; Kamada, Akio; Kawabata, Fumimaru; Uegaki, Tatsufumi; and Miyake, Shigeru, to Kawasaki Steel Corporation. Steel pipe welding method. 4,527,033, Cl. 219-61.000.

Matt, Timothy S., to Doboy Packaging Machinery, Inc. Wrapping machine and method. 4,525,977, Cl. 53-55.000.

Mattel, Inc.: *See—*
Guerrero, Benjamin G., 4,526,553, Cl. 446-380.000.
Rhodes, Tony, 4,526,552, Cl. 446-320.000.

Matthaei, Horst: *See—*
Bohg, Armin; Hartmann, Kurt; and Matthaei, Horst, 4,527,139, Cl. 335-256.000.

Matz, Gary F., to Calgon Corporation. Copolymers of maleic anhydride and alkylene oxide to inhibit the precipitation and deposit of scale in aqueous systems. 4,526,957, Cl. 528-366.000.

Maul, Heinz P.: *See—*
Hirschmann, Adolf M.; Kaser, Klaus; Rieker, Hans; Busch, Hans-Peter; Rathke, Willi; and Maul, Heinz P., 4,526,294, Cl. 222-47.000.

Maurer, Richard P.: *See—*
Holtrop, James S.; and Maurer, Richard P., 4,526,829, Cl. 428-245.000.

Mautner, Franz; Schwarzler, Peter; and Mittermaier, Manfred, to Krauss-Maffei Aktiengesellschaft. Railway truck for self-propelled railway vehicles. 4,526,107, Cl. 105-133.000.

Max-Planck-Gesellschaft Zur Foerderung Der Wissenschaften e.V.: *See—*
Hartwig, Peter; Weppner, Werner; and Wichelhaus, Winfried, 4,526,855, Cl. 429-191.000.

Maya, Jakob, to GTE Products Corporation. Arc discharge device with improved isotopic mixture of mercury. 4,527,086, Cl. 313-485.000.

Maya, Jakob: *See—*
Bouchard, Andre C.; Maya, Jakob; Loughridge, Fred; Andress, Charles W.; and Wierzbicki, Julian, 4,527,088, Cl. 313-493.000.
Bouchard, Andre C.; and Maya, Jakob, 4,527,089, Cl. 313-493.000.

Mayer, Robert. Lockable hitch pin. 4,526,396, Cl. 280-515.000.

Maytag Company, The: *See—*
Bales, Michael E., 4,526,332, Cl. 248-27.100.
Wunderlich, Daniel F., 4,526,535, Cl. 432-105.000.

Mazda Motor Corporation: *See—*
Kijima, Takao; and Maebayashi, Jiro, 4,526,400, Cl. 280-701.000.

Mazzini, Mazzino, to Alamak SA. Actuating device for reciprocating grippers in shuttleless looms. 4,526,212, Cl. 139-449.000.

McAfee, Richard C.: *See—*
Bennington, Lester D.; and McAfee, Richard C., 4,526,955, Cl. 528-33.000.

McCall, Kenneth E.: *See—*
Johnson, David E.; Aebersold, Larry A.; and McCall, Kenneth E., 4,527,037, Cl. 219-69.00R.

McCartney Manufacturing Co., Inc.: *See—*
Saurwein, Albert C., 4,526,000, Cl. 60-540.000.

McCarty, George W.; and Smith, Somers H., III, to Solid State Chargers Research & Development. Charger for batteries. 4,527,110, Cl. 320-2.000.

McCormick Morgan, Inc.: *See—*
Maier, Robert L., 4,526,090, Cl. 98-33.100.

McCracken, William L.: *See—*
Harkless, Lloyd B.; McCracken, William L.; and Colosimo, Joseph A., 4,527,055, Cl. 250-234.000.

McElreath, Kenneth W.; and Fabian, Gordon R., to Rockwell International Corporation. Automatic flight control pilot assist system. 4,527,242, Cl. 364-434.000.

McGarry, Phillip E.: *See—*
Burgess, Lester E.; Fox, Karl M.; and McGarry, Phillip E., 4,526,585, Cl. 44-51.000.

McGill, Francis R.: *See—*
Fleming, Ted D.; Koch, Dan A.; McGill, Francis R.; Powers, Ray P.; and Michaelsen, Roy H., 4,526,318, Cl. 236-49.000.

McGill, Stephen T.: *See—*
Fleming, Ted D.; Koch, Dan A.; McGill, Francis R.; Powers, Ray P.; and Michaelsen, Roy H., 4,526,318, Cl. 236-49.000.

McGregor, Harold R. Bag filling apparatus. 4,526,214, Cl. 141-59.000.

McHenry, Robert J.; and Seebohm, Robert, to American Can Company. Multi-layer container and method of making same. 4,526,821, Cl. 428-35.000.

McKelvey, Thomas E.; and Guarnieri, Joseph J., to United States of America, Energy. Spring loaded thermocouple module. 4,527,005, Cl. 136-221.000.

McKinley, Mark J.; and Applegath, Douglas D., to Dow Chemical Company, The. Method of inhibiting lost circulation from a wellbore. 4,526,240, Cl. 175-72.000.

McLaughlin, John R.: *See—*
Carlson, David A.; and McLaughlin, John R., 4,527,000, Cl. 585-16.000.

McLoughlin, Thomas P., to Institute for Industrial Research and Standards. Fence assembly. 4,526,347, Cl. 256-33.000.

McMackins, Dudley E.: *See—*
Coleman, James P.; Hallcher, Richard C.; Rogers, Thomas E.; and McMackins, Dudley E., 4,526,990, Cl. 549-326.000.

McNeil, Brian A., to Air Products and Chemicals, Inc. Plant for producing gaseous nitrogen. 4,526,595, Cl. 62-28.000.

McNeil, Maynard W.: *See—*
Lemke, Kenneth W.; and McNeil, Maynard W., 4,526,968, Cl. 546-139.000.

McNeil, Reginald K.; and Spector, George. Boot safety attachment. 4,525,939, Cl. 36-7.600.

McWethy, Gary V. Modular high rise construction utilizing assembly line modules. 4,525,975, Cl. 52-745.000.

Mead Corporation, The: *See—*
Waters, James R., 4,526,652, Cl. 162-110.000.

Mease, Richard B.; and Burridge, Robert E., to M&D International Enterprises, Inc. Bouyant hanger unit for dental film chip. 4,526,457, Cl. 354-345.000.

Medical Magnetics, Inc.: *See—*
Blechman, Abraham; and Pescatore, Eugene A., 4,526,539, Cl. 433-18.000.

Mediscus Products Limited: *See—*
Hunt, William V.; Coletta, John A.; Howling, Richard J.; and Higgs, Leonard, 4,525,885, Cl. 5-453.000.

Medlinsky, Edward I. Internal combustion engine. 4,526,139, Cl. 123-26.000.

Medlock, Alfred A. Golf club swing training device. 4,526,373, Cl. 273-186.00R.

Mehra, Yuv R., to El Paso Hydrocarbons Company. Process for flexibly rejecting selected components obtained from natural gas streams. 4,526,594, Cl. 62-17.000.

Mehrotra, Deepak; Kant, Rajni; and Patel, Kishor M., to Raytheon Company. Configurable logic gate array. 4,527,115, Cl. 324-73.00R.

Meier, David P.: *See—*
Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., 4,527,237, Cl. 364-200.000.

Meier, Jacques, to Ferag AG. Method of, and apparatus for, removing flat products, especially printed products, from a winding core. 4,525,982, Cl. 53-430.000.

Meiji Seika Kaisha, Ltd.: *See*—
Oiso, Hisayoshi; Joyama, Norio; Fujimoto, Kazuhiro; and Okamoto, Kozo, 4,526,525, Cl. 425-9.000.
Meinershagen, Charles I.; and Weale, Susan G. Back brace for director's chair. 4,526,423, Cl. 297-440.000.
Melamine Chemicals, Inc.: *See*—
Allan, G. Graham, 4,526,651, Cl. 162-65.000.
Melis, William; and Saam, Richard D. Separator apparatus. 4,526,691, Cl. 210-521.000.
Melles, Harold W.: *See*—
Hennessey, Richard G.; Beemer, Richard B.; and Melles, Harold W., 4,526,255, Cl. 192-3.580.
Menasha Corporation: *See*—
Swingley, Harold E., Jr., 4,527,222, Cl. 361-415.000.
Mendenhall, Marcus H.: *See*—
Tombrello, Thomas A.; Qiu, Yuanxun; and Mendenhall, Marcus H., 4,526,624, Cl. 148-1.500.
Mengel, Loretta S.: *See*—
Clark, John I.; Mengel, Loretta S.; and Benedek, George B., 4,526,789, Cl. 514-627.000.
Mengshoel, Hans C.; and Gusrud, Svein A. Sitting device. 4,526,422, Cl. 297-243.000.
Mennemann, Karl: *See*—
Grabowski geb. Marszalek, Danuta; Ross, Ludwig; Geiler, Volkmar; and Mennemann, Karl, 4,526,874, Cl. 501-77.000.
Menown, Hugh; Newton, Barry P.; and Neale, Christopher V., to English Electric Valve Company Limited. Thyratron capable of reverse conduction. 4,527,090, Cl. 313-592.000.
Mensi, Carlo: *See*—
Biorcio, Luciano; and Mensi, Carlo, 4,526,912, Cl. 523-456.000.
Menter, Gerald A.: *See*—
Menter, J. Alan; and Menter, Gerald A., 4,526,530, Cl. 431-34.000.
Menter, J. Alan; and Menter, Gerald A., to Hollowick, Inc. Burner for liquid candle. 4,526,530, Cl. 431-34.000.
Mercer, Alec V.: *See*—
Fleck, Fritz; Mercer, Alec V.; and Oates, Malcolm, 4,526,976, Cl. 548-159.000.
Mercer, John E.: *See*—
Sisson, Steve S.; Tremoulet, Olivier L., Jr.; and Mercer, John E., 4,525,911, Cl. 29-156.80R.
Merchant, Harish D.; Morris, James G.; and Scharf, Gunther, to Continental Can Company. Process for the manufacture of continuous strip cast aluminum alloy suitable for can making. 4,526,625, Cl. 148-2.000.
Merck & Co., Inc.: *See*—
Durette, Philippe L.; and Gallagher, Timothy F., 4,526,999, Cl. 514-549.000.
Mercuri, Robert A.; and Criscione, John M., to Union Carbide Corporation. Nuclear graphite. 4,526,834, Cl. 428-408.000.
Merrell Dow Pharmaceuticals Inc.: *See*—
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., 4,526,981, Cl. 548-321.000.
Peet, Norton P.; and Sunder, Shyam, 4,526,979, Cl. 548-251.000.
Mertens, Dieter: *See*—
van der Pol, Ronald; and Mertens, Dieter, 4,527,107, Cl. 318-642.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Puritz, Wolfgang, 4,525,918, Cl. 29-568.000.
Messinger, Alexander. Space dividers and method of manufacture. 4,526,250, Cl. 181-295.000.
Metal Closures Limited: *See*—
Herbert, James F., 4,526,284, Cl. 215-329.000.
Metallurgie Hoboken-Overpelt: *See*—
Felix, Noel F.; and Vermeylen, Guido C., 4,526,768, Cl. 423-531.000.
Metzbower, Edward A.: *See*—
Moon, Deug W.; and Metzbower, Edward A., 4,527,040, Cl. 219-121.0LD.
Meyerson, Bernard S., to International Business Machines Corporation. Restrictor plug device with filter for a gas supply system. 4,526,593, Cl. 55-385.00R.
Michaelsen, Roy H.: *See*—
Fleming, Ted D.; Koch, Dan A.; McGill, Francis R.; Powers, Ray P.; and Michaelsen, Roy H., 4,526,318, Cl. 236-49.000.
Michaud, Jean-Francois: *See*—
Bruel, Michel; Floccari, Michel, deceased; and Michaud, Jean-Francois, 4,527,044, Cl. 219-121.0EB.
Micro Component Technology, Inc.: *See*—
Petrich, Dennis M.; and Wilstrup, Jan B., 4,527,126, Cl. 328-155.000.
Microdot Inc.: *See*—
Repella, James A., 4,526,386, Cl. 277-188.00R.
Microdynamics, Inc.: *See*—
Martell, Charles R.; Leslie, Elmer N.; and Treadwell, Stephen S., 4,526,114, Cl. 112-262.100.
Midland, Richard W.; and Rozansky, Boris, to Zenith Electronics Corporation. Index signal enhancement circuit. 4,527,192, Cl. 358-67.000.
Midori-Anzen Industry Co., Ltd.: *See*—
Kimura, Kenzi; and Kanda, Hiroyuki, 4,527,140, Cl. 336-175.000.
Mielnik, Thaddeus J., Jr.; and Wolff, Robert A., to American Sterilizer Company. Apparatus for constraining a human limb: 4,526,165, Cl. 128-133.000.
Mieno, Eiichirou: *See*—
Yoshizawa, Akinori; Nakane, Yasuo; Hagimori, Kenji; Ohgai, Koya; Arisawa, Norisada; Takahashi, Tadashi; Maekawara, Hideaki; Imaizumi, Hiroyuki; Tsuchida, Hideyuki; Mieno, Eiichirou; and Sugino, Kenji, 4,526,611, Cl. 75-0.50B.
Migliacci, Antonio; Bono, Giancarlo; and Tognoli, Piero, to Industria Prefabbricati Affini I.P.A. S.p.A. Process and apparatus for precasting prestressed-concrete workpieces. 4,526,739, Cl. 264-228.000.
Mihayashi, Keiji; Takada, Shunji; and Kobayashi, Hidetoshi, to Fuji Photo Film Co., Ltd. Color photographic material comprising silver halide light-sensitive and non light-sensitive layers. 4,526,863, Cl. 430-505.000.
Miisho, Kazuyuki: *See*—
Hara, Seinosuke; Aoyama, Shunichi; and Miisho, Kazuyuki, 4,526,142, Cl. 123-90.160.
Miladinovic, Milorad, to Lindsay Specialty Products Limited. Parabolic reflector formed of connectable half-sections. 4,527,167, Cl. 343-840.000.
Miles Laboratories, Inc.: *See*—
Boger, David L.; Johnson, Leighton C.; and Pugh, Jerry T., 4,526,753, Cl. 422-56.000.
Clemens, A. H.; and Hough, David L., 4,526,568, Cl. 604-4.000.
Wogoman, Frank, 4,526,445, Cl. 350-534.000.
Milillo, William D., to Xerox Corporation. Jam clearance baffle. 4,526,464, Cl. 355-3.0SH.
Miller, Anne T.: *See*—
Harrison, William J.; Reynolds, Andrew J.; Kellaway, Michael J.; MacMichael, Donald B. A.; and Miller, Anne T., 4,526,215, Cl. 141-83.000.
Miller, Charles J., to Universal Well Control Systems. Blowout preventer. 4,526,339, Cl. 251-1.300.
Miller, Frank J., to Milwaukee Valve Company. Tamper-proof valve. 4,526,194, Cl. 137-385.000.
Miller, Gabriel L.: *See*—
Boie, Robert A.; and Miller, Gabriel L., 4,526,043, Cl. 73-862.040.
Miller, Granville G.: *See*—
Elsenbaumer, Ronald L.; Miller, Granville G.; and Toth, James E., 4,526,708, Cl. 252-518.000.
Millipore Corporation: *See*—
Carson, William W., 4,526,053, Cl. 74-424.80C.
Kiovsky, Joseph R.; and Hendrick, Clifford L., 4,526,690, Cl. 210-335.000.
Milton Roy Company: *See*—
Bingler, Douglas J., 4,526,507, Cl. 415-170.00B.
Milwaukee Valve Company: *See*—
Miller, Frank J., 4,526,194, Cl. 137-385.000.
Mimmel, Herbert: *See*—
Kopinga, Wiert; and Mimmel, Herbert, 4,527,017, Cl. 179-115.5PV.
Mimura, Yoshiyuki: *See*—
Okada, Takao; Toda, Akitoshi; and Mimura, Yoshiyuki, 4,526,848, Cl. 430-55.000.
Minnesota Mining and Manufacturing Company: *See*—
Burguette, Mario D.; and Foss, George D., 4,526,833, Cl. 428-336.000.
Froehlich, Harold E., 4,526,174, Cl. 128-335.000.
Kitchin, Jonathan P., 4,526,860, Cl. 430-373.000.
Minolta Camera Kabushiki Kaisha: *See*—
Kawamura, Kunio; Mukai, Hiromu; and Karasaki, Toshihiko, 4,526,458, Cl. 354-406.000.
Mischke, Walter, to Deutsche Babcock Aktiengesellschaft. Nozzle for a fluidized bed firing system. 4,526,111, Cl. 110-245.000.
Misczyk, Gerald P., to Brockway, Inc., (NY). Fatty acid emulsion and coating of glassware therewith. 4,526,816, Cl. 427-417.000.
Mistral Windsurfing A.G.: *See*—
Gaide, Albert, 4,526,120, Cl. 114-39.000.
Mitani, Hisashi: *See*—
Hishikawa, Yasuo; Mitani, Hisashi; and Ando, Masanao, 4,526,483, Cl. 384-106.000.
Mitani, Yoshio, to Murata Kikai Kabushiki Kaisha. Slide fork positioning apparatus. 4,526,502, Cl. 414-282.000.
Mitel Corporation: *See*—
Styrna, Zbigniew B., 4,527,014, Cl. 179-81.00B.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Hirano, Yasutaka, 4,526,252, Cl. 187-20.000.
Hosokawa, Yasuhiko; and Morishima, Naoki, 4,527,109, Cl. 318-715.000.
Sato, Yasuo; Fukushima, Akio; Kaise, Toshiro; Honda, Yoshiyuki; Uemura, Kazuho; and Fujii, Manabu, 4,526,010, Cl. 62-126.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikazu; and Shibata, Akiyoshi, 4,526,921, Cl. 524-405.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hayase, Masao; and Araki, Yozo, 4,525,978, Cl. 53-167.000.
Kamisaka, Makoto; Okamoto, Toshiro; Ohshima, Michio; and Tamai, Mamoru, 4,527,002, Cl. 585-648.000.
Okamoto, Toshiro; and Ohshima, Michio, 4,527,003, Cl. 585-648.000.
Tateishi, Mataji; Kunimoto, Etsuo; and Takaishi, Tatsuo, 4,526,151, Cl. 123-468.000.
Mitsubishi Rayon Company, Limited: *See*—
Kishida, Kazuo; Hasegawa, Akira; Kawachi, Yasunori; Kawasaki, Hiroshi; and Mizukoshi, Hiroshi, 4,526,929, Cl. 525-80.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Sakashita, Takeshi; Inagaki, Hajime; Todo, Akira; and Nakano, Takayuki, 4,526,920, Cl. 524-850.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Okada, Hiroshi; Itagaki, Hideyuki; Kano, Takehiko; and Masuko, Seiichi, 4,526,656, Cl. 202-158.000.

Mittermaier, Manfred: *See*—
Mautner, Franz; Schwarzler, Peter; and Mittermaier, Manfred, 4,526,107, Cl. 105-133.000.
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, to Toyota Jidosha Kabushiki Kaisha. Metal cored ceramic surfaced fine powder material and apparatus and method for making it. 4,526,610, Cl. 75-0.5BC.
Miura, Masayoshi: *See*—
Kojima, Tamotsu; Miura, Masayoshi; and Oda, Gen, 4,527,175, Cl. 346-140.00R.
Miya, Masayoshi: *See*—
Sakurai, Hisaya; Ikegami, Tadashi; Miya, Masayoshi; and Takaya, Katsuhiko, 4,526,941, Cl. 526-127.000.
Miyadera, Yasuo: *See*—
Fujioka, Atsushi; Miyadera, Yasuo; and Fukuda, Tomio, 4,526,838, Cl. 428-458.000.
Miyakawa, Nobuaki: *See*—
Kuboki, Shigeo; Kato, Kazuo; and Miyakawa, Nobuaki, 4,527,148, Cl. 340-347.0AD.
Miyake, Shigeru: *See*—
Matsuyama, Junya; Kamada, Akio; Kawabata, Fumimaru; Uegaki, Tatsufumi; and Miyake, Shigeru, 4,527,033, Cl. 219-61.000.
Miyamatsu, Yasunori; Kaga, Yasuo; Aizawa, Masanori; Ishibashi, Kazuhisa; and Ueno, Hiroshi, to Toyo Seikan Kaisha Ltd. Shock-resistant easily-openable vessel closure. 4,526,287, Cl. 220-260.000.
Miyanaka, Motoshi; Toudo, Kenzi; and Sagawa, Toshiaki, to Hitachi, Ltd. Flame detecting apparatus. 4,527,125, Cl. 328-6.000.
Miyawaki, Junichi: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikazu; and Shibata, Akiyoshi, 4,526,921, Cl. 524-405.000.
Miyoshi, Takehiko; Matsumoto, Tadayuki; and Sano, Keizo, to Toray Industries, Inc. Polyester fiber and method for the production thereof. 4,526,738, Cl. 264-176.00F.
Mizukoshi, Hiroshi: *See*—
Kishida, Kazuo; Hasegawa, Akira; Kawachi, Yasunori; Kawasaki, Hiroshi; and Mizukoshi, Hiroshi, 4,526,929, Cl. 525-80.000.
Mizuno, Kozo: *See*—
Kazino, Hiroshi; Isomura, Hiroshi; and Mizuno, Kozo, 4,525,912, Cl. 29-243.520.
Mizuno, Yoshio: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahashi, Toshinori; and Kiuchi, Tsutomu, 4,527,171, Cl. 346-76.0PH.
Mizusawa Industrial Chemicals, Ltd.: *See*—
Usui, Koichi; Sato, Teiji; and Tanaka, Masanori, 4,527,178, Cl. 346-207.000.
Mizusawa, Masashi: *See*—
Watanabe, Hiroshi; Shimamura, Isao; Abe, Masao; and Mizusawa, Masashi, 4,526,671, Cl. 204-37.600.
Mobil Oil Corporation: *See*—
Chester, Arthur W.; and Murray, James G., 4,526,942, Cl. 526-130.000.
Chu, Pochen; and Kuhl, Gunter H., 4,526,880, Cl. 502-71.000.
Dwyer, Francis G.; and Chu, Pochen, 4,526,879, Cl. 502-71.000.
Johnson, David E., 4,526,074, Cl. 83-97.000.
Reimann, George J., 4,526,639, Cl. 156-182.000.
Mochida, Haruo; and Watanuki, Yoshio, to Nissan Motor Co., Ltd. Reciprocating type push-pull cable arrangement for transmitting longitudinal motion. 4,526,057, Cl. 74-501.00R.
Mochizuki, Hideto. Beach sandals. 4,525,940, Cl. 36-8.100.
Mohlmann, Willem M. M.: *See*—
Boskamp, Jelles V.; and Mohlmann, Willem M. M., 4,526,709, Cl. 252-527.000.
Mohon, Windell N.; and Burns, Jimmy H., to United States of America, Navy. Diurnal effects simulator. 4,526,545, Cl. 434-38.000.
Molex Incorporated: *See*—
Aso, Akira, 4,526,436, Cl. 339-176.0MF.
Molins Machine Company, Inc.: *See*—
Grobman, William, 4,526,102, Cl. 101-425.000.
Molins plc: *See*—
Labbe, Francis A. M., 4,526,182, Cl. 131-109.100.
Molnar, Istvan; Thiele, Kurt; Geissmann, Felix; and Jahn, Ulrich, to Siegfried Aktiengesselschaft. Antihypertensive 4-(2-imidazolin-2-yl-amino)-2-methyl-indazole. 4,526,898, Cl. 514-392.000.
Money, David K., to Telectronics Pty. Ltd. Self-balancing current sources for a delta modulator. 4,527,133, Cl. 332-11.00D.
Monigold, Larry E.; and Lewis, Ordale, to Kysor Industrial Corporation. Mechanical engine protection system. 4,526,140, Cl. 123-41.150.
Monsanto Company: *See*—
Coleman, James P.; Hallcher, Richard C.; Rogers, Thomas E.; and McMackins, Dudley E., 4,526,990, Cl. 549-326.000.
Holtrop, James S.; and Maurer, Richard P., 4,526,829, Cl. 428-245.000.
Montgomery, John A.: *See*—
Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., 4,526,964, Cl. 544-279.000.
Mookherjee, Braja D.: *See*—
Luccarelli, Domenick, Jr.; Mookherjee, Braja D.; Wilson, Richard A.; Zampino, Michael J.; and Bowen, David R., 4,526,798, Cl. 426-534.000.
Moon, Deug W.; and Metzbower, Edward A., to United States of America, Navy. Method of laser welding. 4,527,040, Cl. 219-121.0LD.
Moore, Robert L.: *See*—
Christensen, Richard G.; and Moore, Robert L., 4,526,859, Cl. 430-314.000.
Moore, Robert R.; and Lamb, Steve R. Arthroscopic leg holder. 4,526,355, Cl. 269-328.000.
Moore, William C.: *See*—
Newman, Richard W.; Moore, William C.; and Richards, Byron A., 4,526,449, Cl. 351-205.000.
Morel, Andre; and Morel, Jacques, to Etablissements Morelateliers Electromecanique De Favieres. Cartridge for injecting a semi-pasty product. 4,526,295, Cl. 222-82.000.
Morel, Jacques: *See*—
Morel, Andre; and Morel, Jacques, 4,526,295, Cl. 222-82.000.
Morgan, David W.; and Andrews, Roland E., to Tektronix, Inc. Signal processing system employing charge transfer devices. 4,527,117, Cl. 324-121.00R.
Morgan, Howard W. In-line strainer. 4,526,689, Cl. 210-323.200.
Mori, Yoshio: *See*—
Ooi, Kazushige; Fujiwara, Shigekazu; Yoshida, Nobuaki; and Mori, Yoshio, 4,527,189, Cl. 358-29.000.
Morikawa, Yoshitsugu; Nomoto, Kiyoshi; and Okada, Kenichi, to Shin-Etsu Polmer Co., Ltd. Keyboard switch assembly. 4,527,021, Cl. 200-5.00A.
Morimoto, Yoshiro: *See*—
Tanaka, Yoshikazu; Hirano, Hiroyuki; Abo, Keiju; Kumura, Haruyoshi; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,526,557, Cl. 474-18.000.
Morise, Hiroshi: *See*—
Uemura, Yahiro; Arimura, Hirofumi; Morise, Hiroshi; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,526,782, Cl. 424-85.000.
Morishima, Naoki: *See*—
Hosokawa, Yasuhiko; and Morishima, Naoki, 4,527,109, Cl. 318-715.000.
Morishita, Hirosada: *See*—
Takahashi, Akio; Shimazaki, Takeshi; Wajima, Motoyo; and Morishita, Hirosada, 4,526,835, Cl. 428-413.000.
Moriya, Tatsuo, to Kabushiki Kaisha Suwa Seikosha. Analog display electronic timepiece with multi-speed hand movement. 4,526,475, Cl. 368-157.000.
Morizur, Jean Y. H.; and Yeou, Victor, to Poclain. Hydraulic loading shovels. 4,526,085, Cl. 91-6.000.
Morris, Gene R.: *See*—
David, Donald M.; and Morris, Gene R., 4,526,084, Cl. 86-38.000.
Morris, James G.: *See*—
Merchant, Harish D.; Morris, James G.; and Scharf, Gunther, 4,526,625, Cl. 148-2.000.
Morris, John C.; and Jackson, Winston J., Jr., to Eastman Kodak Company. Shaped articles from poly(ethylene terephthalate) modified with trans-4,4'-stilbenedicarboxylic acid. 4,526,822, Cl. 428-35.000.
Morrison, Glenn C. 2,4-Dihydro-5-[(substituted)phenyl]-4,4-disubstituted-3H-pyrazol-3-ones. 4,526,982, Cl. 548-336.000.
Morrison, Thomas R. Cadence meter. 4,526,036, Cl. 73-493.000.
Morse, David L.: *See*—
Beall, George H.; Borrelli, Nicholas F.; and Morse, David L., 4,526,873, Cl. 501-5.000.
Mortellacci, Robert J. Power billiard cue adaptor. 4,526,370, Cl. 273-69.000.
Moser, David: *See*—
Parkhurst, Warren E.; and Moser, David, 4,526,667, Cl. 204-196.000.
Moser, Robert L.; and Wilhelm, Donald F., to Helm Instrument Company, Inc. Load sensing probe. 4,526,044, Cl. 73-862.060.
Moses, Peter R.: *See*—
Kearney, Susan D.; and Moses, Peter R., 4,526,846, Cl. 429-194.000.
Moskalik, Leonid M.: *See*—
Bykov, Anatoly P.; Orlov, Anatoly A.; Gribanov, Dmitry D.; Kulesh, Vladimir P.; Fonov, Sergei D.; Egorov, Vitaly V.; Moskalik, Leonid M.; Martynov, Apollinary K.; and Ryadchikov, Vladimir E., 4,526,471, Cl. 356-373.000.
Mostek Corporation: *See*—
Guterman, Daniel C., 4,527,258, Cl. 365-185.000.
Motoike, Yasuo: *See*—
Saji, Ikutaro; Sato, Kenzo; Hanma, Noritaka; and Motoike, Yasuo, 4,526,983, Cl. 548-341.000.
Motoki, Yoshinobu: *See*—
Kido, Yasuji; Yoshida, Tsutomu; Hamakado, Toshinari; Anno, Masami; Harada, Takahiro; and Motoki, Yoshinobu, 4,526,866, Cl. 435-68.000.
Motorola, Inc.: *See*—
Adams, Victor J.; and Polka, Frank, 4,526,740, Cl. 264-259.000.
Brown, Kenneth H., 4,527,127, Cl. 329-122.000.
Herold, Barry W.; and Davis, Walter L., 4,527,131, Cl. 331-116.0FE.
Ingle, William M.; Peffley, Marilyn S.; and Setty, H. S. Nagaraja, 4,526,769, Cl. 423-342.000.
Johnson, Robert A., 4,526,050, Cl. 74-89.220.
Mouterde, Pierre: *See*—
Mutschler, Ulrich; Caparros, Pierre; Mouterde, Pierre; and Frappe, Pierre, 4,526,210, Cl. 139-59.000.
Moutonnier, Claude: *See*—
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,526,962, Cl. 544-016.000.
Mowbray, Dorian F.; and Potter, James C., to Lucas Industries. Reciprocable plunger fuel injection pump. 4,526,519, Cl. 417-490.000.
Muchi, Tsuneo: *See*—
Igarashi, Kimizo; Takigawa, Katsumi; Muchi, Tsuneo; Matsumoto, Yoshio; Ueno, Kiichi; and Ohkoshi, Akio, 4,526,601, Cl. 65-59.100.

Mueller, Robert S., to Eaton Corporation. Variable speed accessory drive. 4,526,257, Cl. 192-48.200.

Muise, Herbert D., to Weyerhaeuser Company. Tray with partitions formed from sidewalls. 4,526,315, Cl. 229-27.000.

Mukai, Hiromu: *See—*
Kawamura, Kunio; Mukai, Hiromu; and Karasaki, Toshihiko, 4,526,458, Cl. 354-406.000.

Mukai, Yasuo; and Takazawa, Yosuke, to Victor Company of Japan, Ltd. Magnetic recording media comprising a reaction product of a specific type of fluorine resin and a curing polymer material as a binder in the magnetic layer thereof. 4,526,836, Cl. 428-421.000.

Mull, J. C., Jr.: *See—*
Cerveny, Leonard W.; Bonham, Christopher; Mull, J. C., Jr.; and Shellman, Jon V., 4,526,285, Cl. 220-7.000.

Muller, Anton; Konig, Hubert; and Herdeg, Karl, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Tensioning device, especially for lashing chains. 4,525,900, Cl. 24-68.0CT.

Muller-Girard, Otto; and Schulp, Philip P., to Transmation, Inc. Instrument protective device. 4,527,217, Cl. 361-179.000.

Muller, Heinz-Joachim, to Kleindienst Aquatec GmbH & Co. KG. Determination of nitrate in water and catalyst therein. 4,526,870, Cl. 436-110.000.

Muller, Lutz: *See—*
Heiker, Fred R.; Muller, Lutz; Puls, Walter; and Bischoff, Hilmar, 4,526,784, Cl. 514-25.000.

Muller, Wolfgang F.: *See—*
Hambrecht, Juergen; Brandstetter, Franz; Ziegler, Walter; Muller, Wolfgang F.; Bronstert, Klaus; and Echte, Adolf, 4,526,927, Cl. 525-68.000.

Munekuni, Hajime: *See—*
Yoshida, Mitsuo; Matsucka, Hiroyoshi; and Munekuni, Hajime, 4,526,663, Cl. 204-98.000.

Munzer, Rudolf: *See—*
Gupta, Ashok K.; Gyarmati, Erno ; Munzer, Rudolf; and Naoumidis, Aristides, 4,526,649, Cl. 156-629.000.

Mura, Hideichi: *See—*
Chino, Koichi; Kudo, Kazuhiko; Oda, Akira; Mura, Hideichi; and Takamura, Yoshiyuki, 4,526,713, Cl. 252-632.000.

Muraguchi, Yutaka, to Hoko Sangyo Co., Ltd. Support structure for checking and repairing heavy rotatable objects. 4,526,503, Cl. 414-433.000.

Murahashi, Tatsuya: *See—*
Shudo, Yasunobu; Kano, Masayoshi; Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,526,121, Cl. 114-73.000.

Murakami, Fumikazu, to Kabushiki Kaisha Daini Seikosha. Piezoelectric buzzer for wrist watches. 4,526,477, Cl. 368-250.000.

Murakami, Shuji: *See—*
Yasuda, Yutaka; Hirata, Yasuo; Murakami, Shuji; Nakamura, Katsuhiro; and Furuya, Yukitsuna, 4,527,279, Cl. 375-114.000.

Murase, Masao: *See—*
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,526,894, Cl. 514-312.000.

Murata Kikai Kabushiki Kaisha: *See—*
Mitani, Yoshio, 4,526,502, Cl. 414-282.000.

Murata Manufacturing Co., Ltd.: *See—*
Arakawa, Hajime, 4,527,147, Cl. 338-162.000.
Imamura, Eiji; and Shoji, Toshio, 4,527,229, Cl. 363-126.000.

Murata, Moriyasu: *See—*
Kuroda, Muthmi; Murata, Moriyasu; Takeda, Tsunesi; and Tamura, Junich, 4,526,698, Cl. 252-99.000.

Murdock, Keith C.; and Webb, Richard L., to American Cyanamid Company. Polymeric[[(oxazolidinyl)alkyl]amino]anthraquinones. 4,526,788, Cl. 514-374.000.

Murdock, Keith C.; and Durr, Frederick E., to American Cyanamid Company. 1,4-Bis (substituted-amino)-5,8-dihydroxy-anthraquinones and leuco bases thereof. 4,526,989, Cl. 549-316.000.

Murphy, Richard A.: *See—*
Ceccon, Harry; Murphy, Richard A.; Reed, H. David; and Orringer, Oscar, 4,526,039, Cl. 73-774.000.

Murray, James G.: *See—*
Chester, Arthur W.; and Murray, James G., 4,526,942, Cl. 526-130.000.

Murray, Kevin P.: *See—*
Lewarchik, Ronald J.; Murray, Kevin P.; Donovan, Marcella G.; and Jones, Arthur T., 4,526,939, Cl. 525-438.000.

Murray, Robert W. Christmas tree decoration. 4,526,819, Cl. 428-7.000.

Mussinelli, Gian L.: *See—*
Bianchi, Guiseppe; and Mussinelli, Gian L., 4,526,666, Cl. 204-196.000.

Mutschler, Ulrich; Caparros, Pierre; Mouterde, Pierre; and Frappe, Pierre, to Staubli-Versol S.A.R.L. Easily replaceable weaving mechanism needle assembly. 4,526,210, Cl. 139-59.000.

Muzhzhaviev, Konstantin D.: *See—*
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.

Myers, Ronald T., to Brockway, Inc. Method for the lubrication of delivery equipment and molds used in production of glass articles. 4,526,600, Cl. 65-24.000.

Myhren, Jan; and Gitlestad, Svein E., to Elkem Chemicals, Inc. Apparatus and method for separating large from small particles suspended in a gas stream. 4,526,678, Cl. 209-2.000.

Mylan Pharmaceuticals Inc.: *See—*
Blume, Cheryl D.; and Bonner, Paul H., 4,526,777, Cl. 424-20.000.

Naaktgeboren, Adrianus, to Sperry Corporation. Baler feeder mechanism. 4,525,991, Cl. 56-341.000.

Nadella: *See—*
Durivault, Jean; and Branche, Bernard, 4,526,336, Cl. 248-349.000.

Nagahara, Shusaku: *See—*
Takahashi, Kenji; Nagahara, Shusaku; Ozawa, Naoki; Kudo, Koji; and Hirano, Chikafusa, 4,527,200, Cl. 358-213.000.

Nagai, Kiyoshi: *See—*
Shinohara, Hiroshi; and Nagai, Kiyoshi, 4,527,042, Cl. 219-121.0LC.

Nagai, Kunio: *See—*
Kozakai, Daisuke; Amano, Toshio; and Nagai, Kunio, 4,527,204, Cl. 360-33.100.

Nagasaku, Eiichi: *See—*
Kondo, Makoto; Nagasaku, Eiichi; Yamamoto, Yuuji; and Taya, Tosiki, 4,526,524, Cl. 418-255.000.

Nagase, Masao: *See—*
Takahasshi, Toshihiro; Sueda, Noriyoshi; Tsuji, Masahiro; Tahara, Yoshiyuki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Nagase, Masao; and Sugai, Toshiji, 4,526,893, Cl. 514-309.000.

Nagashima, Masayoshi; Yamane, Hiroshi; Kikkawa, Shigeru; and Teraki, Yoshinori, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal transfer recording apparatus. 4,527,172, Cl. 346-76.0PH.

Nagle, Dennis C.: *See—*
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,526,911, Cl. 523-445.000.

Nagoshi, Fumiya: *See—*
Mathumoto, Shigemi; and Nagoshi, Fumiya, 4,526,928, Cl. 525-76.000.

Nagumo, Fumio; and Asaida, Takashi, to Sony Corporation. Digital signal processing circuit. 4,527,191, Cl. 358-30.000.

Nakade, Shinichi, to Sumitomo Rubber Industries, Ltd. Golf ball. 4,526,375, Cl. 273-235.00R.

Nakagawa, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Eccentricity correction for an optical disk device. 4,527,263, Cl. 369-46.000.

Nakagawa, Yoshinori; Yoneda, Tsutomu; and Matsuda, Shoji, to Shiken, Ltd. Dental hygienic device. 4,526,570, Cl. 604-20.000.

Nakai, Yasuo: *See—*
Shudo, Yasunobu; Kano, Masayoshi; Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,526,121, Cl. 114-73.000.

Nakajima, Jun; Araya, Takeshi; Aso, Tadashi; Kawamata, Kiyoshi; and Sugimoto, Kinji, to Hitachi Seiko Ltd. Control apparatus for an arc welder. 4,527,045, Cl. 219-130.310.

Nakajima, Yukio: *See—*
Ishii, Fumiaki; Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Takamura, Koji; and Nakamura, Takeaki, 4,526,623, Cl. 134-21.000.
Takamura, Koji; Ishii, Fumiaki; Nakajima, Yukio; Yabe, Hisao; Sasa, Hiroyuki; and Nakamura, Takeaki, 4,526,622, Cl. 134-21.000.

Nakama, Daiji; and Kimura, Shigeru, to Nifco Inc. Holding device. 4,526,333, Cl. 248-73.000.

Nakamura, Katsuhiro: *See—*
Yasuda, Yutaka; Hirata, Yasuo; Murakami, Shuji; Nakamura, Katsuhiro; and Furuya, Yukitsuna, 4,527,279, Cl. 375-114.000.

Nakamura, Keiji: *See—*
Hiraoka, Takeshi; Urano, Shigeru; Takeshita, Masajiro; and Nakamura, Keiji, 4,526,617, Cl. 75-236.000.

Nakamura, Shinji: *See—*
Owaki, Isao; Saito, Susumu; Fujii, Yasuhiko; and Nakamura, Shinji, 4,527,207, Cl. 360-73.000.

Nakamura, Takeaki: *See—*
Ishii, Fumiaki; Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Takamura, Koji; and Nakamura, Takeaki, 4,526,623, Cl. 134-21.000.
Takamura, Koji; Ishii, Fumiaki; Nakajima, Yukio; Yabe, Hisao; Sasa, Hiroyuki; and Nakamura, Takeaki, 4,526,622, Cl. 134-21.000.

Nakane, Masami, to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted oxamide prostaglandin analogs and their use in treating thrombolytic disease. 4,526,901, Cl. 514-469.000.

Nakane, Yasuo: *See—*
Yoshizawa, Akinori; Nakane, Yasuo; Hagimori, Kenji; Ohgai, Koya; Arisawa, Norisada; Takahashi, Tadashi; Maekawara, Hideaki; Imaizumi, Hiroyuki; Tsuchida, Hideyuki; Mieno, Eiichirou; and Sugino, Kenji, 4,526,611, Cl. 75-0.50B.

Nakano, Takayuki: *See—*
Sakashita, Takeshi; Inagaki, Hajime; Todo, Akira; and Nakano, Takayuki, 4,526,920, Cl. 524-850.000.

Nakayama, Yasuaki; and Kamiyama, Yasuo, to Citizen Watch Company Limited. Correction system for hands display type of electronic timepiece. 4,526,476, Cl. 368-189.000.

Nandoh, Kenji: *See—*
Hattori, Motonobu; Ishibashi, Akira; Ishida, Hiromi; and Nandoh, Kenji, 4,527,214, Cl. 361-96.000.

Nanodata Computer Corporation: *See—*
Frieder, Gideon; Hughes, David T.; Kline, Mark H.; Liebel, John T., Jr.; Meier, David P.; and Wolff, Edward A., 4,527,237, Cl. 364-200.000.

Naoumidis, Aristides: *See—*
Gupta, Ashok K.; Gyarmati, Erno ; Munzer, Rudolf; and Naoumidis, Aristides, 4,526,649, Cl. 156-629.000.
Narasaka, Shin; Otsuka, Kazuo; and Kishida, Eiji, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio control system for an internal combustion engine. 4,526,148, Cl. 123-440.000.
Narishige, Eiichi; and Yoneyama, Shinji, to Narishige Scientific Instrument Laboratory, Ltd. Fine control system for a glass electrode or the like. 4,526,169, Cl. 128-303.00B.
Narishige Scientific Instrument Laboratory, Ltd.: *See—*
Narishige, Eiichi; and Yoneyama, Shinji, 4,526,169, Cl. 128-303.00B.
Narita, Kazuo: *See—*
Taya, Akira; Narita, Kazuo; Akiyama, Jun-etsu; Asada, Masao; and Nira, Hisami, 4,527,087, Cl. 313-487.000.
Narumi China Corporation: *See—*
Anazawa, Shinzo; Yamada, Hitoshi; Noda, Kuniharu; and Fujimoto, Yasuyuki, 4,527,010, Cl. 174-52.0FP.
Naser, Georg: *See—*
Hassler, Dieter; Kresse, Heinz; Reichenberger, Helmut; and Naser, Georg, 4,526,168, Cl. 128-303.00R.
National Geographic Society: *See—*
Schaeffer, Merle J., 4,526,546, Cl. 434-145.000.
National Semiconductor Corporation: *See—*
Bittner, Harry J.; Culmer, Daniel D.; and Davis, Walter R., 4,527,128, Cl. 330-9.000.
National Starch and Chemical Corporation: *See—*
Schmidt, Robert C., Jr.; and Puletti, Paul P., 4,526,577, Cl. 604-366.000.
Natsume, Toshio: *See—*
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,526,610, Cl. 75-0.5BC.
Navarro, Christine: *See—*
Caplan, Jerome S.; Delmege, James W.; Laman, Robert R.; and Navarro, Christine, 4,527,012, Cl. 179-18.0ES.
Nawrocki, Nicholas F.; and Dodson, Matt R., to Helm Instrument Company, Inc. Digital processing and comparison device. 4,527,156, Cl. 340-753.000.
NCR Corporation: *See—*
Donaldson, Darrel D.; Honnigford, Edward H.; and Poeppelman, Alan D., 4,527,074, Cl. 307-246.000.
Neal, Vernon S.: *See—*
Son, Adelina J.; Neal, Vernon S.; and Garvey, Christopher M., 4,526,693, Cl. 252-8.50B.
Neale, Christopher V.: *See—*
Menown, Hugh; Newton, Barry P.; and Neale, Christopher V., 4,527,090, Cl. 313-592.000.
NEC Corporation: *See—*
Kasukawa, Yasuhiko, 4,526,431, Cl. 339-45.00R.
Takeyasu, Yoshiyuki, 4,527,129, Cl. 330-45.000.
Yasuda, Yutaka; Hirata, Yasuo; Murakami, Shuji; Nakamura, Katsuhiro; and Furuya, Yukitsuna, 4,527,279, Cl. 375-114.000.
Necowitz, Loretta A. Convertible bed. 4,525,883, Cl. 5-93.00B.
Nelle, Gunther: *See—*
Burkhardt, Horst; and Nelle, Gunther, 4,527,056, Cl. 250-237.00G.
Nelson, Daniel C.: *See—*
Pepper, Roger T.; Nelson, Daniel C.; and Lewing, Douglas S., 4,526,770, Cl. 423-447.400.
Nelson, John M., to Newell Companies, Inc. Self-igniting torch. 4,526,532, Cl. 431-255.000.
Nelson, Norman A. Wellhead connector. 4,526,406, Cl. 285-18.000.
Nesbitt, Raymond A., to AT&T Technologies, Inc. Process for improved wall definition of an additive printed circuit. 4,526,810, Cl. 427-98.000.
Neste Oy: *See—*
Selin, Johan; Huttunen, Jouko; Turunen, Olli; Eklund, Vidar; and Ekman, Kurt, 4,526,620, Cl. 106-203.000.
Nestec, S.A.: *See—*
Ingenbleek, Yves; Traitler, Helmut; and Wessely, Jean-Yves, 4,526,793, Cl. 426-72.000.
Netter, Jean: *See—*
Pottgens, Anton, 4,526,049, Cl. 74-87.000.
Networks Electronic Corp.: *See—*
Patrichi, Mihai D.; and Evanson, Delbert L., 4,527,025, Cl. 200-61.080.
Neuman, Hanna: *See—*
Olsson, Sven-Gunnar; Jonson, Bjorn; and Neuman, Hanna, 4,526,188, Cl. 137-3.000.
Newell Companies, Inc.: *See—*
Nelson, John M., 4,526,532, Cl. 431-255.000.
Newman, Don, to Stretch Devices, Inc. Roller for screen tensioning and printing frame. 4,525,909, Cl. 29-121.100.
Newman, Richard W.; Moore, William C.; and Richards, Byron A., to Welch Allyn Inc. Optical system for illuminated viewing instruments. 4,526,449, Cl. 351-205.000.
Newsome, Reginald W.: *See—*
Nichols, Walter A.; Newsome, Reginald W.; and Geiszler, Willard A., Jr., 4,526,183, Cl. 131-336.000.
Newton, Barry P.: *See—*
Menown, Hugh; Newton, Barry P.; and Neale, Christopher V., 4,527,090, Cl. 313-592.000.
NGK Spark Plug Co., Ltd.: *See—*
Yamamoto, Yoshihiro; and Sakurai, Kenji, 4,526,875, Cl. 501-87.000.
NHK Spring Co., Ltd.: *See—*
Ohno, Akira; and Inoue, Kanji, 4,526,628, Cl. 148-12.00B.
Nibby, Chester M., Jr.; Goldin, Reeni; and Andrews, Timothy A., to Honeywell Information Systems Inc. Remap method and apparatus for a memory system which uses partially good memory devices. 4,527,251, Cl. 364-900.000.
Nichols, Walter A.; Newsome, Reginald W.; and Geiszler, Willard A., Jr., to Philip Morris Incorporated. Filter cigarette. 4,526,183, Cl. 131-336.000.
Nicholson, Roland E.: *See—*
Winkelman, Robert A.; and Nicholson, Roland E., 4,526,391, Cl. 280-12.00S.
Niedballa, Ulrich; and Gries, Heinz, to Schering, Aktiengesellschaft. 2-Amino-1-(1,3-dioxolan-4-yl)-ethanol compounds, their preparation and use. 4,526,994, Cl. 549-451.000.
Niemiro, Thaddeus A.; and Machaj, Daniel F., to Rockwell International Corporation. Reversible color deck for rotary printing presses. 4,526,099, Cl. 101-220.000.
Nifco Inc.: *See—*
Nakama, Daiji; and Kimura, Shigeru, 4,526,333, Cl. 248-73.000.
Nihon Kaiheiki Kogyo Kabushiki Kaisha: *See—*
Ohashi, Shigeo; and Kawashima, Yoshiharu, 4,527,023, Cl. 200-11.00G.
Nikko Co., Ltd.: *See—*
Kai, Tatsuya, 4,526,531, Cl. 431-189.000.
Nippon Electric Co., Ltd.: *See—*
Anazawa, Shinzo; Yamada, Hitoshi; Noda, Kuniharu; and Fujimoto, Yasuyuki, 4,527,010, Cl. 174-52.0FP.
Ishihara, Yasuo; Oda, Eiji; and Teranishi, Nobukazu, 4,527,182, Cl. 357-24.000.
Ito, Yoshinori, 4,527,020, Cl. 179-170.200.
Watanabe, Takeshi, 4,527,259, Cl. 365-189.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Amano, Takehisa, 4,526,080, Cl. 84-1.030.
Oguri, Shigenori, 4,526,079, Cl. 84-1.030.
Suzuki, Shigeru; and Tsutsumi, Kazumasu, 4,527,206, Cl. 360-71.000.
Nippon Kogaku K.K.: *See—*
Hirose, Hideo, 4,526,443, Cl. 350-415.000.
Nohda, Masao, 4,526,451, Cl. 351-211.000.
Ooi, Kazushige; Fujiwara, Shigekazu; Yoshida, Nobuaki; and Mori, Yoshio, 4,527,189, Cl. 358-29.000.
Nippon Piston Ring Co., Ltd.: *See—*
Hiraoka, Takeshi; Urano, Shigeru; Takeshita, Masajiro; and Nakamura, Keiji, 4,526,617, Cl. 75-236.000.
Nippon Shinyaku Co. Ltd.: *See—*
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,526,894, Cl. 514-312.000.
Nippon Telegraph & Telephone Public Corporation: *See—*
Kakii, Toshiaki; Toda, Yuichi; Matsuno, Koichiro; Usui, Yuichi; and Matsumoto, Michito, 4,526,732, Cl. 264-2.700.
Nippon Tenshashi Kabushiki Kaisha: *See—*
Ibata, Sachiko, 4,526,589, Cl. 51-295.000.
Nippondenso Co., Ltd.: *See—*
Kondo, Makoto; Nagasaku, Eiichi; Yamamoto, Yuuji; and Taya, Tosiki, 4,526,524, Cl. 418-255.000.
Yamazoe, Hisamitsu; Matsuura, Hideki; Ito, Katsunori; and Ohba, Masahiro, 4,526,042, Cl. 75-861.750.
Nira, Hisami: *See—*
Taya, Akira; Narita, Kazuo; Akiyama, Jun-etsu; Asada, Masao; and Nira, Hisami, 4,527,087, Cl. 313-487.000.
Nisato, Dino; and Boveri, Sergio, to Sanofi. 3-Amino-n-[2-(5-dimethylaminomethylfuran-2-ylmethylthio)ethyl]benzamide intermediate. 4,526,995, Cl. 549-494.000.
Nishijima, Toyoki; Sasaki, Masao; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Method of providing an increased brightening effect and silver halide photographic material having increased brightening effect. 4,526,853, Cl. 430-139.000.
Nishimatsu, Masaharu: *See—*
Ohtsuki, Akira; Konno, Ryozo; Sugai, Makio; Nishimatsu, Masaharu; Kubota, Yuichi; Tanaka, Kazushi; and Shinoura, Osamu, 4,526,837, Cl. 428-425.900.
Nishimura, Akihiro: *See—*
Suzuki, Yasunobu; Chiba, Seiichi; and Nishimura, Akihiro, 4,526,646, Cl. 156-361.000.
Nishimura, Takahiro, to Allied Corporation. Apparatus for rapid changing of nozzles. 4,526,304, Cl. 222-607.000.
Nishio, Ken-ichi: *See—*
Yamatsuta, Kohji; and Nishio, Ken-ichi, 4,526,841, Cl. 428-614.000.
Nishizawa, Jun-ichi; Ito, Kazuomi; and Okuno, Yasuo, to Jun-Ichi Nishizawa. Method of fabricating a semiconductor pn junction. 4,526,632, Cl. 148-171.000.
Niskanen, Erkki, to Erkki Niskanen Oy. Blocking valve for liquids. 4,526,200, Cl. 137-625.470.
Nissan Motor Company, Limited: *See—*
Hara, Seinosuke; Aoyama, Shunichi; and Miisho, Kazuyuki, 4,526,142, Cl. 123-90.160.
Hiraiwa, Kazuyoshi, 4,526,052, Cl. 74-339.000.
Honma, Masahiro; and Inokuchi, Iwane, 4,526,145, Cl. 123-357.000.
Mochida, Haruo; and Watanuki, Yoshio, 4,526,057, Cl. 74-501.00R.
Shiraishi, Yasuhiro, 4,527,105, Cl. 318-444.000.
Takase, Sadao; Oshiage, Katsunori; Yamamoto, Akito; and Hosaka, Akio, 4,527,248, Cl. 364-565.000.
Tanaka, Yoshikazu; Hirano, Hiroyuki; Abo, Keiju; Kumura, Haruyoshi; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,526,557, Cl. 474-18.000.

Yamaki, Kiyoshi; Suzuki, Hidetaka; Tanaka, Haruto; and Takeuchi, Yasuhisa, 4,527,155, Cl. 340-727.000.
Yoshimoto, Teruko; Kawai, Mikio; and Kunimi, Hitoshi, 4,526,659, Cl. 204-56.00R.

Nisshin Flour Milling Co., Ltd.: *See*—
Takahashi, Toshihiro; Sueda, Noriyoshi; Tsuji, Masahiro; Tahara, Yoshiyuki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Nagase, Masao; and Sugai, Toshiji, 4,526,893, Cl. 514-309.000.

Nisshin Steel Co., Ltd.: *See*—
Kubota, Michio; and Shoji, Takeshi, 4,526,103, Cl. 101-459.000.

Nissin Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Hiroo, 4,526,089, Cl. 92-98.00D.

Nitto Kasei Co., Ltd.: *See*—
Imazaki, Hideyuki; and Sakamoto, Kazuhiko, 4,526,932, Cl. 525-326.700.

Nixon, David A. Transmission sealing apparatus. 4,526,275, Cl. 206-231.000.

Noda, Kuniharu: *See*—
Anazawa, Shinzo; Yamada, Hitoshi; Noda, Kuniharu; and Fujimoto, Yasuyuki, 4,527,010, Cl. 174-52.0FP.

Nohda, Masao, to Nippon Kogaku K.K. Apparatus for measuring the refractive power of an optical system. 4,526,451, Cl. 351-211.000.

Noll, Marvin H. Apparatus and process for inserting inserts into envelopes. 4,525,986, Cl. 53-569.000.

Nolte, David B., to Global Navigation, Inc. Cathode ray tube digital brightness control circuit. 4,527,197, Cl. 358-168.000.

Nomoto, Kiyoshi: *See*—
Morikawa, Yoshitsugu; Nomoto, Kiyoshi; and Okada, Kenichi, 4,527,021, Cl. 200-5.00A.

Nomura, Tadatoshi: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,526,894, Cl. 514-312.000.

Nordstrom, Jon T.: *See*—
Logan, Max C.; and Nordstrom, Jon T., 4,526,011, Cl. 62-176.100.

Norota, Susumu; Segawa, Yasuhiko; Kiriyama, Tsutomu; Emi, Shingo; Imoto, Tadasi; and Yamauchi, Tetsuo, to Teijin Limited. Process for producing fibrous assembly. 4,526,735, Cl. 264-27.000.

North, Donald F.: *See*—
Fisher, Don J.; and North, Donald F., 4,526,378, Cl. 277-12.000.

Northern Petrochemical Company: *See*—
Buehler, Charles K., 4,526,883, Cl. 502-108.000.

Northern Research & Engineering Corp.: *See*—
Heitmann, Arnold M., 4,526,199, Cl. 137-625.310.

Northern Telecom Limited: *See*—
Dumoulin, Andre ; Seguin, Marc; and Bouffard, Jean, 4,525,993, Cl. 57-58.520.

Notaro, Giuseppe: *See*—
De Filippis, Pietro; Salvatore, Amedeo; Calenda, Ciro; and Notaro, Giuseppe, 4,527,142, Cl. 337-105.000.

Novinson, Thomas, to United States of America, Navy. Portable infrared spectrophotometer. 4,527,062, Cl. 250-351.000.

Novy, Russell F.: *See*—
Rausch, John J.; and Novy, Russell F., 4,526,817, Cl. 427-431.000.

Nugent, James E., to Water & Industrial Waste Laboratories, Inc. Reserve pit waste treatment system. 4,526,687, Cl. 210-202.000.

Nujack Oil Pump Corporation: *See*—
Stanton, George E., 4,526,048, Cl. 74-53.000.

Numata, Yoshihiko: *See*—
Takada, Kazuya; Toyama, Shigeyuki; and Numata, Yoshihiko, 4,526,772, Cl. 423-556.000.

Nusslein, Hans: *See*—
Puchta, Rolf; Nusslein, Hans; Boeck, Alexander; and Streschnak, Benno, 4,526,694, Cl. 252-8.800.

NWL Transformers: *See*—
Seitz, James P.; and Zara, Rodger A., 4,527,221, Cl. 361-379.000.

Nylund, Olov; and Scholin, Bertil, to AB ASEA-Atom. Fuel assembly with a water flow separated from the fuel rods. 4,526,745, Cl. 376-444.000.

Nylund, Olov: *See*—
Borrman, Bo; Leine, Lars; Nylund, Olov; and Ode, Bengt, 4,526,744, Cl. 376-440.000.

Nyman, Bror G.: *See*—
Blomquist, Seppo I.; Saarela, Markku T.; Pouru, Hannu J.; Nyman, Bror G.; Lindroos, Kaj-Henrik; Koivunen, Timo T.; and Fugleberg, Sigmund P., 4,526,650, Cl. 156-642.000.

Oates, Malcolm: *See*—
Fleck, Fritz; Mercer, Alec V.; and Oates, Malcolm, 4,526,976, Cl. 548-159.000.

Oatey Co.: *See*—
Kifer, David E., 4,526,407, Cl. 285-42.000.

Obara, Hideo: *See*—
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,527,174, Cl. 346-136.000.
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,527,176, Cl. 346-141.000.

Oberli, Rudolf, to Greiner Instruments AG. Method and apparatus for transferring a liquid sample. 4,526,046, Cl. 73-864.160.

Occidental Chemical Corporation: *See*—
Fitzpatrick, Stephen T.; and Krawiec, Richard M., 4,526,946, Cl. 526-202.000.

Oce-Nederland B.V.: *See*—
Eertink, Bastiaan B. B., 4,526,461, Cl. 355-14.00R.
van der Voort, Gabriel N. M. M.; and Groeneveld, Marinus, 4,526,849, Cl. 430-57.000.

Oda, Akira: *See*—
Chino, Koichi; Kudo, Kazuhiko; Oda, Akira; Mura, Hideichi; and Takamura, Yoshiyuki, 4,526,713, Cl. 252-632.000.

Oda, Eiji: *See*—
Ishihara, Yasuo; Oda, Eiji; and Teranishi, Nobukazu, 4,527,182, Cl. 357-24.000.

Oda, Gen: *See*—
Kojima, Tamotsu; Miura, Masayoshi; and Oda, Gen, 4,527,175, Cl. 346-140.00R.

Ode, Bengt: *See*—
Borrman, Bo; Leine, Lars; Nylund, Olov; and Ode, Bengt, 4,526,744, Cl. 376-440.000.

O'Doherty, George O. P.; and Clinton, Albert J. Anticoccidial combinations comprising polyether antibiotics and carbanilides. 4,526,997, Cl. 560-21.000.

Oelsch, Jurgen, to Preh Elektrofeinmechanische Werke, Jakob Preh Nachf., GmbH & Co. Keyboard. 4,527,030, Cl. 200-306.000.

Offredi, Giovanni, to Gnecchi and Company S.p.A. Support for a one-piece telephone. 4,527,018, Cl. 179-146.00R.

Oguri, Shigenori, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic rhythm performance device for electronic musical instruments. 4,526,079, Cl. 84-1.030.

Ohara, Kazuya: *See*—
Imagawa, Toshiyuki; and Ohara, Kazuya, 4,527,281, Cl. 455-165.000.

Ohara, Terumi: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahashi, Toshinori; and Kiuchi, Tsutomu, 4,527,171, Cl. 346-76.0PH.

Ohashi, Shigeo; and Kawashima, Yoshiharu, to Nihon Kaiheiki Kogyo Kabushiki Kaisha. Small-sized rotary switch. 4,527,023, Cl. 200-11.00G.

Ohaus Scale Corporation: *See*—
EerNisse, Errol P.; Gaiser, Mark D.; Hanley, John P.; Kistler, Walter P.; Paros, Jerome M.; and Wiggins, Robert B., 4,526,247, Cl. 177-210.0FP.

Ohba, Masahiro: *See*—
Yamazoe, Hisamitsu; Matsuura, Hideki; Ito, Katsunori; and Ohba, Masahiro, 4,526,042, Cl. 75-861.750.

Ohgai, Koya: *See*—
Yoshizawa, Akinori; Nakane, Yasuo; Hagimori, Kenji; Ohgai, Koya; Arisawa, Norisada; Takahashi, Tadashi; Maekawara, Hideaki; Imaizumi, Hiroyuki; Tsuchida, Hideyuki; Mieno, Eiichirou; and Sugino, Kenji, 4,526,611, Cl. 75-0.50B.

Ohi, Nobukazu; Ohno, Koji; and Tosaki, Satoshi, to G-C Dental Industrial Corp. Gypsum composition for denture investment. 4,526,619, Cl. 106-35.000.

Ohio State University, The: *See*—
Stevens, Vernon C., 4,526,716, Cl. 260-112.50R.

Ohkoshi, Akio: *See*—
Igarashi, Kimizo; Takigawa, Katsumi; Muchi, Tsuneo; Matsumoto, Yoshio; Ueno, Kiichi; and Ohkoshi, Akio, 4,526,601, Cl. 65-59.100.

Ohno, Akira; and Inoue, Kanji, to NHK Spring Co., Ltd. Method of manufacturing a car stabilizer. 4,526,628, Cl. 148-12.00B.

Ohno, Koji: *See*—
Ohi, Nobukazu; Ohno, Koji; and Tosaki, Satoshi, 4,526,619, Cl. 106-35.000.

Ohshima, Michio: *See*—
Kamisaka, Makoto; Okamoto, Toshiro; Ohshima, Michio; and Tamai, Mamoru, 4,527,002, Cl. 585-648.000.
Okamoto, Toshiro; and Ohshima, Michio, 4,527,003, Cl. 585-648.000.

Ohta, Tatsuo, to Konishiroku Photo Industry Co., Ltd. Evaporator. 4,526,132, Cl. 118-719.000.

Ohta, Tomozo, to Oki Electric Industry Co., Ltd. High sensitivity FM signal demodulation system. 4,527,187, Cl. 358-23.000.

Ohta, Yoshihiko, to Victor Company of Japan, Limited. Method and apparatus for recording/reproducing a control signal on and from video signal recordings by an erase head. 4,527,202, Cl. 360-18.000.

Ohtsuki, Akira; Konno, Ryozo; Sugai, Makio; Nishimatsu, Masaharu; Kubota, Yuichi; Tanaka, Kazushi; and Shinoura, Osamu, to Toyo Ink MFG. Co., Ltd.; and TDK Electronics Co., Ltd. Magnetic recording medium. 4,526,837, Cl. 428-425.900.

Oiso, Hisayoshi; Joyama, Norio; Fujimoto, Kazuhiro; and Okamoto, Kozo, to Meiji Seika Kaisha, Ltd. Fleecy confectionery producing machine. 4,526,525, Cl. 425-9.000.

Okada, Hiroshi; Itagaki, Hideyuki; Kano, Takehiko; and Masuko, Seiichi, to Mitsui Toatsu Chemicals, Incorporated. Monomeric vinyl chloride stripping tower. 4,526,656, Cl. 202-158.000.

Okada, Kenichi: *See*—
Morikawa, Yoshitsugu; Nomoto, Kiyoshi; and Okada, Kenichi, 4,527,021, Cl. 200-5.00A.

Okada, Takao; Toda, Akitoshi; and Mimura, Yoshiyuki, to Olympus Optical Company Ltd. Electrophotographic process with a.c. charger producing greater positive charge. 4,526,848, Cl. 430-55.000.

Okada, Tokuji; and Kanade, Takeo, to Carnegie-Mellon University. Three-wheeled adjustable vehicle. 4,526,106, Cl. 104-138.00G.

Okamoto, Kozo: *See*—
Oiso, Hisayoshi; Joyama, Norio; Fujimoto, Kazuhiro; and Okamoto, Kozo, 4,526,525, Cl. 425-9.000.

Okamoto, Toshiro; and Ohshima, Michio, to Mitsubishi Jukogyo Kabushiki Kaisha. Thermal cracking process for producing olefins from hydrocarbons. 4,527,003, Cl. 585-648.000.

Okamoto, Toshiro: *See*—
Kamisaka, Makoto; Okamoto, Toshiro; Ohshima, Michio; and Tamai, Mamoru, 4,527,002, Cl. 585-648.000.
Okano, Haruo; Yamazaki, Takashi; Horiike, Yasuhiro; and Horie, Hiromichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Dry etching apparatus using reactive ions. 4,526,643, Cl. 156-345.000.
Okazaki, Akiyasu: *See*—
Hashiura, Masayoshi; Okazaki, Akiyasu; and Suzuki, Sigeru, 4,527,043, Cl. 219-121.0LQ.
Okazaki, Hisayoshi: *See*—
Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, 4,526,719, Cl. 260-346.00R.
Oki Electric Industry Co., Ltd.: *See*—
Kikuchi, Hiroshi; Tanuma, Jiro; Koshida, Yoshinori; and Itaya, Takashi, 4,526,486, Cl. 400-185.000.
Ohta, Tomozo, 4,527,187, Cl. 358-23.000.
Okita, Shin; Shimizu, Hideo; Yamazaki, Noriyuki; Sekiguchi, Fumio; Chimura, Toshihiko; and Shinagawa, Osamu, to Sony Corporation. Tape loading device for magnetic recording and/or reproducing apparatus. 4,527,208, Cl. 360-85.000.
Okoshi, Makoto, deceased: *See*—
Okoshi, Takanori; and Okoshi, Makoto, deceased, 4,526,439, Cl. 350-128.000.
Okoshi, Takanori; and Okoshi, Makoto, deceased (by Okoshi, Takanori, legal representative). Three-dimensional image display apparatus and a screen therefor. 4,526,439, Cl. 350-128.000.
Okoshi, Takanori, legal representative: *See*—
Okoshi, Takanori; and Okoshi, Makoto, deceased, 4,526,439, Cl. 350-128.000.
Okuno, Yasuo: *See*—
Nishizawa, Jun-ichi; Ito, Kazuomi; and Okuno, Yasuo, 4,526,632, Cl. 148-171.000.
Olapinski, Hans: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,526,824, Cl. 428-35.000.
Olds, John R.: *See*—
Alt, Mark R.; and Olds, John R., 4,525,994, Cl. 59-85.000.
Olin Corporation: *See*—
Haque, Reza; Smith, Edward F., III; and Kadija, Igor V., 4,526,806, Cl. 427-41.000.
Olinger, John L.; and Srinivasan, Seshadri, to Owens-Corning Fiberglas Corporation. Gas injection in fiber forming. 4,526,597, Cl. 65-1.000.
Olson, Carl G. Roller apparatus for a flexible web. 4,525,946, Cl. 40-514.000.
Olsson, Nils O.: *See*—
Hale, Richard A.; Olsson, Nils O.; and Reiff, Thomas F 4,526,377, Cl. 277-9.000.
Olsson, Sven-Gunnar; Jonson, Bjorn; and Neuman, Hanna, to Siemens Aktiengesellschaft. Process and apparatus for mixing gases in a specific proportion and dosing the resultant gas mixture. 4,526,188, Cl. 137-3.000.
Olympus Optical Co., Ltd.: *See*—
Ishii, Fumiaki; Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Takamura, Koji; and Nakamura, Takeaki, 4,526,623, Cl. 134-21.000.
Okada, Takao; Toda, Akitoshi; and Mimura, Yoshiyuki, 4,526,848, Cl. 430-55.000.
Takamura, Koji; Ishii, Fumiaki; Nakajima, Yukio; Yabe, Hisao; Sasa, Hiroyuki; and Nakamura, Takeaki, 4,526,622, Cl. 134-21.000.
Yoshizawa, Fukashi, 4,527,104, Cl. 318-331.000.
Onga, Makoto; Sase, Masatoshi; and Yamanaka, Seisuke, to Sony Corporation. Mixing circuit. 4,527,190, Cl. 358-30.000.
Onishi, Masanori: *See*—
Ito, Koji; Onishi, Masanori; and Hayashi, Hisao, 4,527,283, Cl. 382-9.000.
Ono, Taizo: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,526,969, Cl. 546-164.000.
Onoda, Izumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Hermetic type compressor and production methods thereof with reduced thickness casing portions for welding. 4,526,522, Cl. 418-63.000.
Onodera, Kaoru: *See*—
Nishijima, Toyoki; Sasaki, Masao; and Onodera, Kaoru, 4,526,853, Cl. 430-139.000.
Takada, Shun; Onodera, Kaoru; and Kadowaki, Takashi, 4,526,864, Cl. 430-551.000.
Ooi, Kazushige; Fujiwara, Shigekazu; Yoshida, Nobuaki; and Mori, Yoshio, to Tokyo Shibaura Denki Kabushiki Kaisha; and Nippon Kogaku K.K. Color image pickup device. 4,527,189, Cl. 358-29.000.
Ooshima, Katsuaki: *See*—
Fujisawa, Noriyoshi; Ooshima, Katsuaki; Iijima, Junko; and Deguchi, Katsuhiko, 4,526,710, Cl. 252-545.000.
Op De Beeck, Herbert K. M.; Peeters, Joannes M. T.; and Steeman, Peter K. R. M., to U.S. Philips Corporation. Gas and/or vapor discharge lamp provided with a U-shaped discharge tube. 4,527,083, Cl. 313-25.000.
Opel, Helmut. Method for obtaining lacrimal fluid. 4,526,178, Cl. 128-760.000.
Ore-Ida Foods, Inc.: *See*—
Fogerson, Richard D., 4,526,093, Cl. 99-584.000.
Orloff, Anthony D.: *See*—
Haston, James E.; and Orloff, Anthony D., 4,526,367, Cl. 273-1.50R.
Orlov, Anatoly A.: *See*—
Bykov, Anatoly P.; Orlov, Anatoly A.; Gribanov, Dmitry D.; Kulesh, Vladimir P.; Fonov, Sergei D.; Egorov, Vitaly V.; Moskalik, Leonid M.; Martynov, Apollinary K.; and Ryadchikov, Vladimir E., 4,526,471, Cl. 356-373.000.
Ornato, Giorgio: *See*—
Giobbio, Vincenzo; Ornato, Giorgio; Buracchi, Livio; and Mangia, Alberto, 4,526,985, Cl. 549-253.000.
Orndoff, Robert R.: *See*—
Chang, Marguarite S.; and Orndoff, Robert R., 4,526,980, Cl. 548-258.000.
Oronzio de Nora: *See*—
Bianchi, Guiseppe; and Mussinelli, Gian L., 4,526,666, Cl. 204-196.000.
Orringer, Oscar: *See*—
Ceccon, Harry; Murphy, Richard A.; Reed, H. David; and Orringer, Oscar, 4,526,039, Cl. 73-774.000.
Osawa, Kazuya: *See*—
Suyama, Tomio; and Osawa, Kazuya, 4,526,014, Cl. 62-347.000.
Osborne, Eddie A.: *See*—
Hughson, Robert A.; and Osborne, Eddie A., 4,526,232, Cl. 166-339.000.
Oscar Mayer Foods Corporation: *See*—
Mally, Timothy G.; and Stengel, Bruce W., 4,526,505, Cl. 414-750.000.
Oshiage, Katsunori: *See*—
Takase, Sadao; Oshiage, Katsunori; Yamamoto, Akito; and Hosaka, Akio, 4,527,248, Cl. 364-565.000.
Oshima, Noboru; Shimizu, Isamu; Yoshimura, Yoshito; Fujimaki, Tatsuo; and Tomita, Seisuke, to Bridgestone Tire Company Limited. Branched styrene-butadiene copolymers and pneumatic tires using the same. 4,526,934, Cl. 525-332.900.
Oshima, Yujiro; and Aoyama, Taro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Direct injection internal combustion engine of compression ignition type. 4,526,143, Cl. 123-301.000.
Ostapchenko, George J.: *See*—
Hatchadoorian, Edward; Ostapchenko, George J.; Patton, James L.; and Young, Harlan S., 4,526,831, Cl. 428-287.000.
Oster, Terry L., to Dana Corporation. Three mode differential. 4,526,063, Cl. 74-710.500.
Osterholtz, Frederick D.: *See*—
Pickwell, Robert J.; and Osterholtz, Frederick D., 4,526,922, Cl. 524-445.000.
Oswald, Norman D.; Dean, Robert R.; and Mankey, Harry S., to Standard Manufacturing Co., Inc. Auxiliary lift adapter. 4,526,344, Cl. 254-9.00C.
Oto, Duane, to Intel Corporation. MOS Voltage divider structure suitable for higher potential feedback regulation. 4,527,180, Cl. 357-23.600.
Otobe, Yutaka: *See*—
Hasegawa, Shumpei; Gotoh, Osamu; and Otobe, Yutaka, 4,526,153, Cl. 123-480.000.
Otsuka, Kazuo: *See*—
Narasaka, Shin; Otsuka, Kazuo; and Kishida, Eiji, 4,526,148, Cl. 123-440.000.
Outboard Marine Corporation: *See*—
Hansen, Loren F., 4,526,555, Cl. 464-149.000.
Outokumpu Oy: *See*—
Blomquist, Seppo I.; Saarela, Markku T.; Pouru, Hannu J.; Nyman, Bror G.; Lindroos, Kaj-Henrik; Koivunen, Timo T.; and Fugleberg, Sigmund P., 4,526,650, Cl. 156-642.000.
Oval Engineering Co., Ltd.: *See*—
Matsubara, Naoki, 4,526,040, Cl. 73-861.240.
Ovcharenko, Vladimir G.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.
Ovcharov, Vladimir K.: *See*—
Alengoz, Anton S.; Artemenko, Anatoly I.; Danilevsky, Mikhail G.; Kocherga, Vladimir K.; Luchko, Viktor N.; Margolis, Anatoly E.; Ovcharov, Vladimir K.; and Shevchenko, Jury A., 4,526,758, Cl. 422-122.000.
Owaki, Isao; Saito, Susumu; Fujii, Yasuhiko; and Nakamura, Shinji, to Victor Company of Japan, Limited. Tape speed control for producing a master tape carrying a digital signal. 4,527,207, Cl. 360-73.000.
Owen, Daniel V., to General Electric Company. Discrete starter for HID lamp. 4,527,098, Cl. 315-290.000.
Owen, Michael J., to Dow Corning Corporation. Silicone glycol collectors in the beneficiation of fine coal by froth flotation. 4,526,680, Cl. 209-166.000.
Owens-Corning Fiberglas Corporation: *See*—
Evans, Michael E., 4,525,970, Cl. 52-454.000.
Kelman, Josh, 4,525,960, Cl. 52-169.140.
Olinger, John L.; and Srinivasan, Seshadri, 4,526,597, Cl. 65-1.000.
Owens, Robert A.: *See*—
Lewis, James M.; Owens, Robert A.; Sweeney, Richard F.; Wake, Ronald W.; and Rinehart, Robert E., 4,526,856, Cl. 430-191.000.
Ozawa, Naoki: *See*—
Takahashi, Kenji; Nagahara, Shusaku; Ozawa, Naoki; Kudo, Koji; and Hirano, Chikafusa, 4,527,200, Cl. 358-213.000.

P.A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG: *See*—
Korth, Jurgen, 4,526,424, Cl. 297-473.000.
P. D. George Co., The: *See*—
Biorcio, Luciano; and Mensi, Carlo, 4,526,912, Cl. 523-456.000.
Pabst, Manfred, to A. MONFORTS GmbH & Co. Cylinder for guiding a web of textile material. 4,526,533, Cl. 432-4.000.
Pacific Scientific Company: *See*—
Yang, Elmer C., 4,526,047, Cl. 74-25.000.
Pacific Wire Works, Inc.: *See*—
Cerveny, Leonard W.; Bonham, Christopher; Mull, J. C., Jr.; and Shellman, Jon V., 4,526,285, Cl. 220-7.000.
Page, Raymond S., III, executor: *See*—
Stephanoff, Nicholas N., deceased; and Page, Raymond S., III, executor, 4,526,324, Cl. 241-5.000.
Pagels, Louis T.: *See*—
Weiler, Gerhard H.; and Pagels, Louis T., 4,526,279, Cl. 215-32.000.
Paige, William P.: *See*—
Weber, Christian A.; and Paige, William P., 4,526,926, Cl. 525-67.000.
Palacio, Joaquin J.; and Cristobal, Carlos C., to Gang Nail Systems, Inc. Truss assembly and bracing clip and attachment member for use with trusses. 4,525,972, Cl. 52-643.000.
Palm, John W.; and Kunkel, Lorenz V., to Standard Oil Company (Indiana). Cooling and condensing of sulfur and water from Claus process gas. 4,526,590, Cl. 55-27.000.
Palomar Systems & Machines, Inc.: *See*—
Braden, Denver, 4,526,129, Cl. 118-503.000.
Panavision, Inc.: *See*—
Cappels, Richard D., 4,527,201, Cl. 358-224.000.
Pardes, Greg: *See*—
Berger, Richard F.; and Pardes, Greg, 4,526,296, Cl. 222-107.000.
Parein, Eric W. Method of making a book of matches. 4,525,981, Cl. 53-395.000.
Park, Robert W. Combined calculator tape and coupon and method of use. 4,526,403, Cl. 283-62.000.
Parker, Charles A., to Ingersoll-Rand Company. Oil pressure control system. 4,526,523, Cl. 418-84.000.
Parker, James G. Front suspension system for a motorcycle. 4,526,249, Cl. 180-219.000.
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-Ta S.; and Chen, Timothy S., to United States of America, National Aeronautics and Space Administration. Copolymers of vinyl styrlpyridines or vinyl stilbazoles with bismaleimide. 4,526,925, Cl. 524-548.000.
Parker, Ronald J. Portable combination tent and backpack. 4,526,307, Cl. 224-154.000.
Parkhurst, Warren E.; and Moser, David. Corrosion protection anode. 4,526,667, Cl. 204-196.000.
Parkinson, Ward: *See*—
Philofsky, Elliott; Parkinson, Ward; and Wilson, Dennis, 4,527,185, Cl. 357-70.000.
Parmigiani, Fulvio: *See*—
Corti, Mario; and Farmigiani, Fulvio, 4,526,465, Cl. 356-35.500.
Paros, Jerome M.: *See*—
EerNisse, Errol P.; Gaiser, Mark D.; Hanley, John P.; Kistler, Walter P.; Paros, Jerome M.; and Wiggins, Robert B., 4,526,247, Cl. 177-210.0FP.
Parr, Richard S.; Ramachandran, Pallassana N.; Grey, Seymour; and Reinish, Martin D., to Colgate Palmolive Co. Process for manufacturing bentonite-containing particulate fabric softening detergent composition. 4,526,702, Cl. 252-174.250.
Parrock, Joseph J., to American Standard Inc. Keylock with resettable, bendable lever tumblers. 4,526,022, Cl. 70-339.000.
Patel, Kishor M.: *See*—
Mehrotra, Deepak; Kant, Rajni; and Patel, Kishor M., 4,527,115, Cl. 324-73.00R.
Patoray, Stephen A., to Reliance Electric Company. Water-resistant weighing apparatus. 4,526,246, Cl. 177-179.000.
Patrichi, Mihai D.; and Evanson, Delbert L., to Networks Electronic Corp. Miniature delay switch. 4,527,025, Cl. 200-61.080.
Patrick, Clayton D. Protective member for metal coils. 4,526,500, Cl. 410-48.000.
Patterson, Richard M. Adjustable T-square. 4,525,933, Cl. 33-470.000.
Patton, James L.: *See*—
Hatchadoorian, Edward; Ostapchenko, George J.; Patton, James L.; and Young, Harlan S., 4,526,831, Cl. 428-287.000.
Paul Wurth S.A.: *See*—
Legille, Edouard; Bernard, Gilbert; Cimenti, Giovanni; and Thillen, Guy, 4,526,536, Cl. 432-238.000.
Pavlovic, Pavao; and Gnjidic, Branko. Equipment and method for manufacturing thin glass flakes. 4,526,602, Cl. 65-81.000.
Pawsat, Dennis P., to Wald Manufacturing Company, Inc. Bicycle handlebar stem assembly. 4,526,491, Cl. 403-24.000.
Payen, Pierre, to L. Payen and Cie, S.A. Process for making covered elastane yarn. 4,525,992, Cl. 57-18.000.
Payview Limited: *See*—
Cheung, William S. H., 4,527,195, Cl. 358-120.000.
Pearson, Arthur D.: *See*—
Barns, Robert L.; and Pearson, Arthur D., 4,526,599, Cl. 65-3.120.
Pearson, Ernest J., to Chloride Group Public Limited Company. Manufacturing recombination electric storage cells. 4,525,926, Cl. 29-623.100.
Peerless Manufacturing Company: *See*—
Fisher, Don J.; and North, Donald F., 4,526,378, Cl. 277-12.000.
Peerman, Dwight E.; Kanten, H. Gorden; and Bonnema, Kelvin K., to Henkel Corporation. Paintbrush embedment compound and paintbrush construction and method embodying same. 4,525,890, Cl. 15-193.000.
Peet, Norton P.; and Sunder, Shyam, to Dow Chemical Company, The. 3,6,7,8-Substituted-s-triazolo[4,3-b]pyridazines as bronchodilators. 4,526,890, Cl. 514-248.000.
Peet, Norton P.; and Sunder, Shyam, to Merrell Dow Pharmaceuticals Inc. Carbamates and oxalamides of amino-N-(1H-tetrazol-5-yl)benzamides. 4,526,979, Cl. 548-251.000.
Peeters, Joannes M. T.: *See*—
Op De Beeck, Herbert K. M.; Peeters, Joannes M. T.; and Steeman, Peter K. R. M., 4,527,083, Cl. 313-25.000.
Peffley, Marilyn S.: *See*—
Ingle, William M.; Peffley, Marilyn S.; and Setty, H. S. Nagaraja, 4,526,769, Cl. 423-342.000.
Pekkarinen, Michael O., to Baxter Travenol Laboratories, Inc. Differential occlusion sensing method and apparatus. 4,526,574, Cl. 604-52.000.
Pelc, Norbert J., to General Electric Company. Film-based dual energy radiography. 4,526,862, Cl. 430-496.000.
Pellet, Regis J.: *See*—
Mahoney, John A.; Pellet, Regis J.; and Helstrom, John J., 4,526,675, Cl. 208-10.000.
Penner, Bernard: *See*—
Scott, William A.; and Penner, Bernard, 4,526,180, Cl. 130-27.00R.
Pennsylvania Engineering Corporaton: *See*—
Roper, Stephen J., 4,526,352, Cl. 266-228.000.
Pennwalt Corporation: *See*—
Cascone, Paul J., 4,526,750, Cl. 420-463.000.
Pepper, Roger T.; Nelson, Daniel C.; and Lewing, Douglas S., to Fiber Materials, Inc. Method of producing carbon fiber and product thereof. 4,526,770, Cl. 423-447.400.
Perlman, Daniel; and Linschitz, Henry. Oxygen indicator for packaging. 4,526,752, Cl. 422-56.000.
permaTek, Inc.: *See*—
Caughey, Robert A., 4,526,642, Cl. 156-311.000.
Perplies, Eberhard; and Felcht, Utz H., to Hoechst Aktiengesellschaft. Process for etherifying cellulose with alkyl monochloroacetates. 4,526,961, Cl. 536-98.000.
Pescatore, Eugene A.: *See*—
Blechman, Abraham; and Pescatore, Eugene A., 4,526,539, Cl. 433-18.000.
Petersen, Eric R.: *See*—
Binder, Michael; Walker, Charles W., Jr.; Petersen, Eric R.; Wade, William L., Jr.; and Gilman, Sol, 4,526,881, Cl. 502-101.000.
Peterson, William J., to United States of America, Energy. Laterally bendable belt conveyor. 4,526,272, Cl. 198-819.000.
Petiteau, Jacques A. A.: *See*—
d'Agostino, Guy; Dhainaut, Andre ; and Petiteau, Jacques A. A., 4,526,343, Cl. 251-367.000.
Petrakis, Leon: *See*—
Friedlaender, Fritz J.; Takayasu, Makoto; Hwang, Jiann-Yang; and Petrakis, Leon, 4,526,681, Cl. 209-214.000.
Petri, Hector D., to Illinois Tool Works Inc. RF gasket retainer clip. 4,525,904, Cl. 24-458.000.
Petrich, Dennis M.; and Wilstrup, Jan B., to Micro Component Technology, Inc. AC parametric circuit having adjustable delay lock loop. 4,527,126, Cl. 328-155.000.
Petrzilka, Martin; Schadt, Martin; and Villiger, Alois, to Hoffmann-La Roche Inc. Multiring liquid crystal esters. 4,526,704, Cl. 252-299.610.
Pettersson, Tord: *See*—
Lunden, Bengt; and Pettersson, Tord, 4,526,310, Cl. 227-67.000.
Petty, Herbert E.: *See*—
Kilgour, John A.; and Petty, Herbert E., 4,526,996, Cl. 556-413.000.
Petty, Walter L., to Shell Oil Company. Process for preparation of an S-alpha-cyano S-alpha-isopropylphenylacetate. 4,526,727, Cl. 260-465.00D.
Peyronel, Jean-Francois: *See*—
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,526,962, Cl. 544-016.000.
Pfaff Industriemaschinen GmbH: *See*—
Angele, Werner, 4,526,113, Cl. 112-127.000.
Willenbacher, Erich, 4,526,117, Cl. 112-308.000.
Pfeifle, Helmut: *See*—
Guntert, Josef; Hafele, Walter; Pfeifle, Helmut; Schwartz, Reinhard; and Straubel, Max, 4,526,150, Cl. 123-447.000.
Hafele, Walter; Pfeifle, Helmut; Schwartz, Reinhard; and Straubel, Max, 4,526,149, Cl. 123-447.000.
Pfizenmaier, Wolfgang, to Heidelberger Druckmaschinen AG. Device for controlling the lateral position of a web in a web printing machine. 4,527,069, Cl. 250-548.000.
Pfizer Inc.: *See*—
Ainpour, Parviz R., 4,526,579, Cl. 604-265.000.
Bright, Gene M., 4,526,889, Cl. 514-29.000.
Pharr, Roy E., to Fieldcrest Mills, Inc. Carpet loom. 4,526,209, Cl. 139-46.000.
Phelps, Paul E. Golf aid. 4,526,369, Cl. 273-32.00B.
Philip Morris Incorporated: *See*—
Nichols, Walter A.; Newsome, Reginald W.; and Geiszler, Willard A., Jr., 4,526,183, Cl. 131-336.000.
Philips Kommunikations Industrie AG: *See*—
Hillerich, Bernd, 4,527,113, Cl. 324-52.000.
Phillips Petroleum Company: *See*—
Hobbs, James W.; and Halliday, Mary M., 4,526,657, Cl. 203-3.000.
Johnson, Timothy W.; and Stone, Mark L., 4,527,219, Cl. 361-323.000.

Philofsky, Elliott; Parkinson, Ward; and Wilson, Dennis, to AVX Corporation. Integrated circuit device and subassembly. 4,527,185, Cl. 357-70.000.
Photon Chroma, Inc.: *See*—
Plumadore, John D., 4,526,850, Cl. 430-103.000.
Pickwell, Robert J.; and Osterholtz, Frederick D., to Union Carbide Corporation. Organofunctional silane-siloxane oligomer coupling compositions, curable and cured elastomeric compositions containing same and novel electric cable containing said cured elastomeric compositions. 4,526,922, Cl. 524-445.000.
Pidcock, Anthony: *See*—
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Pierburg GmbH & Co.: *See*—
Sudbeck, Rainer; Baumgartner, Hans; and Brandstadter, Manfred, 4,526,521, Cl. 418-55.000.
Pierce, Trudy L.: *See*—
King, Clifford P.; and Pierce, Trudy L., 4,526,301, Cl. 222-153.000.
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Giobbio, Vincenzo; Ornato, Giorgio; Buracchi, Livio; and Mangia, Alberto, 4,526,985, Cl. 549-253.000.
Pike, Jesse L.; and Jennings, Bobby D. Trotline storing and dispensing arrangement. 4,525,949, Cl. 43-57.300.
Pillsbury Company, The: *See*—
Atwell, William A., 4,526,801, Cl. 426-128.000.
Pillsbury, Dale G., to Standard Oil Company (Indiana). Process for the preparation of zero valent bis-arene transition metal compounds. 4,526,724, Cl. 556-43.000.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Watanabe, Hiroshi; Shimamura, Isao; Abe, Masao; and Mizusawa, Masashi, 4,526,671, Cl. 204-37.600.
Pioneer Industrial Products Company: *See*—
Fogt, Kenneth E.; Slosser, James D.; Varos, John A.; and Radhakrishnan, Gopinath, 4,526,828, Cl. 428-229.000.
Piper, Douglas E., to Woven Electronics Corp. Woven controlled balanced transmission line. 4,527,135, Cl. 333-5.000.
Pistillo, John, to Shah, Nayan S. Gas pressure measuring and regulating device and method. 4,526,196, Cl. 137-557.000.
Plastics Engineering Company: *See*—
Korb, Louis L.; and Waitkus, Phillip A., 4,526,924, Cl. 524-541.000.
Plau, Bernard: *See*—
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,526,962, Cl. 544-016.000.
Plumadore, John D., to Photon Chroma, Inc. Diode bias electrophotographic toning system and method. 4,526,850, Cl. 430-103.000.
Pneutek, Inc.: *See*—
Haytayan, Harry M., 4,525,902, Cl. 24-350.000.
Poclain: *See*—
Morizur, Jean Y. H.; and Yeou, Victor, 4,526,085, Cl. 91-6.000.
Podanenko, Alexandr T.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.
Podiak, Richard S.: *See*—
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Podrini, Maurizio. Device for the electrolytic treatment of metal strip. 4,526,668, Cl. 204-206.000.
Poeppelman, Alan D.: *See*—
Donaldson, Darrel D.; Honnigford, Edward H.; and Poeppelman, Alan D., 4,527,074, Cl. 307-246.000.
Pohl, Klaus-Jurgen: *See*—
Hoffmann, Gottfried; Deutsch, Reinhard; and Pohl, Klaus-Jurgen, 4,526,268, Cl. 198-419.000.
Pohlenz, Elmer E.: *See*—
La Barge, Robert L.; Scherf, Thomas W.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Pohlenz, Elmer E., 4,526,096, Cl. 100-53.000.
POLA Chemical Industries, Inc.: *See*—
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Polaroid Corporation: *See*—
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Fantone, Stephen D.; Goward, Robert M.; and Kaplan, Jonathan I., 4,526,444, Cl. 350-501.000.
Fantone, Stephen D., 4,526,467, Cl. 356-124.000.
Johnson, Bruce K.; and Schettino, Anthony J., 4,526,453, Cl. 354-181.000.
Livingston, James J., 4,526,455, Cl. 354-298.000.
Livingston, James J., 4,526,456, Cl. 354-317.000.
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Pomponi, Edward A., Jr., to Binks Manufacturing Company. Fluid supply container for color changer. 4,526,191, Cl. 137-206.000.
Popp, Franz-Wolfgang; and Rosenbach, Klaus, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Container for the long-term storage of radioactive materials such as irradiated nuclear fuel elements. 4,527,065, Cl. 250-506.100.
Porat, Chaim, to Beta Engineering & Industrial Development. Intrusion detection system. 4,527,150, Cl. 340-541.000.
Portalupi, Steven J.; and Riggs, Robert S., to Goodyear Tire & Rubber Company, The. Apparatus for feeding strip material for application to a drum. 4,526,647, Cl. 156-406.400.
Posdal, Ben A.: *See*—
Boxer, Michael A.; and Posdal, Ben A., 4,526,298, Cl. 222-130.000.
Post, Melvin. Screwdriver and joining device. 4,526,071, Cl. 81-451.000.
Post, Sieghard, to U.S. Philips Corporation. Transformer comprising a wound coil former. 4,527,141, Cl. 336-192.000.
Potoski, John R.: *See*—
Commons, Thomas J.; and Potoski, John R., 4,526,977, Cl. 548-246.000.
Potter, James C.: *See*—
Mowbray, Dorian F.; and Potter, James C., 4,526,519, Cl. 417-490.000.
Pottgens, Anton, to Netter, Jean. Vibrator. 4,526,049, Cl. 74-87.000.
Pouru, Hannu J.: *See*—
Blomquist, Seppo I.; Saarela, Markku T.; Pouru, Hannu J.; Nyman, Bror G.; Lindroos, Kaj-Henrik; Koivunen, Timo T.; and Fugleberg, Sigmund P., 4,526,650, Cl. 156-642.000.
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PPG Industries, Inc.: *See*—
Das, Suryya K.; Greigger, Paul P.; Boberski, William G.; Jones, James E.; Schappert, Raymond F.; and Seiner, Jerome A., 4,526,910, Cl. 523-220.000.
Frank, Robert G.; Fecik, Michael T.; and Ewing, John J., 4,526,605, Cl. 65-273.000.
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Reissig, George W., 4,525,958, Cl. 51-283.00E.
Tang, Robert H., 4,526,726, Cl. 260-463.000.
Prasad, Arun, to Futurdent Industries Inc. Crucible for use with broken arm-type centrifugal casting machine. 4,526,221, Cl. 164-289.000.
Preh Elektrofeinmechanische Werke, Jakob Preh Nachf., GmbH & Co.: *See*—
Oelsch, Jurgen, 4,527,030, Cl. 200-306.000.
Preis, Lothar; Hoffmann, Jurgen; and Rompf, Kurt, to Bayer Aktiengesellschaft. Anchoring element for fibrous composite materials. 4,526,492, Cl. 403-268.000.
Preist, Donald H., to Varian Associates, Inc. Density modulated electron beam tube with enhanced gain. 4,527,091, Cl. 315-5.000.
Premier Microwave Corp.: *See*—
Wantuch, Ernest, 4,527,134, Cl. 333-1.100.
Premium Plastics, Inc.: *See*—
Stephenson, Stanley, 4,526,172, Cl. 128-322.000.
Prentiss, William C.; and Price, David N., to Rohm and Haas Company. Process for producing leather. 4,526,581, Cl. 8-94.330.
Price, David N.: *See*—
Prentiss, William C.; and Price, David N., 4,526,581, Cl. 8-94.330.
Primdahl, Richard D., to Dresser Industries, Inc. Control apparatus for hydraulic valve. 4,526,204, Cl. 137-637.000.
Primus, William F.: *See*—
Bryan, Larry E.; Grove, Richard W.; and Primus, William F., 4,525,914, Cl. 29-402.080.
Princell, William E. Spare tire lock. 4,526,021, Cl. 70-183.000.
Process Supply Company, Inc.: *See*—
Fields, Melvin C.; and Fields, Paul F., 4,526,621, Cl. 127-1.000.
Procter & Gamble Company, The: *See*—
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Proprietary Technology, Inc.: *See*—
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Prudhon, Francois: *See*—
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Pryde, Everett H.: *See*—
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PTC Aerospace Inc.: *See*—
Brennan, Edward J.; Long, William A.; and Brunelle, Rene J., 4,526,421, Cl. 297-232.000.
Puchta, Rolf; Nusslein, Hans; Boeck, Alexander; and Streschnak, Benno, to Henkel Kommanditgesellschaft (Henkel KGaA). Acid-containing product for the treatment of moist wash in the mechanical clothes drier. 4,526,694, Cl. 252-8.800.
Pugh, Jerry T.: *See*—
Boger, David L.; Johnson, Leighton C.; and Pugh, Jerry T., 4,526,753, Cl. 422-56.000.
Puletti, Paul P.: *See*—
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Heiker, Fred R.; Muller, Lutz; Puls, Walter; and Bischoff, Hilmar, 4,526,784, Cl. 514-25.000.
Purdue Research Foundation: *See*—
Friedlaender, Fritz J.; Takayasu, Makoto; Hwang, Jiann-Yang; and Petrakis, Leon, 4,526,681, Cl. 209-214.000.
Puritz, Wolfgang, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Two component tool holder, especially for a machine tool or robot. 4,525,918, Cl. 29-568.000.
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Tombrello, Thomas A.; Qiu, Yuanxun; and Mendenhall, Marcus H., 4,526,624, Cl. 148-1.500.
Quadrant Drive B.V.: *See—*
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Quality Services Incorporated: *See—*
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Quartz Engineering & Materials, Inc.: *See—*
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Quartztronics, Inc.: *See—*
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R. A. Jones & Co. Inc.: *See—*
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R. P. Cargille Laboratories, Inc.: *See—*
Sacher, Robert L.; and Sacher, William J., 4,526,711, Cl. 252-582.000.
Ra-Shipping Ltd. Oy: *See—*
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Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,526,582, Cl. 8-107.000.
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Fogt, Kenneth E.; Slosser, James D.; Varos, John A.; and Radhakrishnan, Gopinath, 4,526,828, Cl. 428-229.000.
Radke, Clayton J., to United States of America, Energy. Process for tertiary oil recovery using tall oil pitch. 4,526,231, Cl. 166-270.000.
Raj, Kuldip, to Ferrofluidics Corporation. Stabilized ferrofluid-ferrofluid seal apparatus and method. 4,526,379, Cl. 277-80.000.
Raj, Kuldip; and Gowda, Hanumaiah L., to Ferrofluidics Corporation. Single pole piece multiple-stage ferrofluid seal apparatus. 4,526,380, Cl. 277-80.000.
Raj, Kuldip; and Gowda, Hanumaiah L., to Ferrofluidics Corporation. Radially polarized multiple-stage ferrofluid seal apparatus. 4,526,382, Cl. 277-80.000.
Rajeckas, Algis: *See—*
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Ramachandran, Pallassana N.: *See—*
Parr, Richard S.; Ramachandran, Pallassana N.; Grey, Seymour; and Reinish, Martin D., 4,526,702, Cl. 252-174.250.
Ramachandran, Venkataraman, to Ethyl Corporation. 2-Amino-4-(4-pyridinyl)benzoic acids. 4,526,975, Cl. 546-335.000.
Rantakari, Pekka, to Martela OY. Device for adjusting the height of desktop, chair or similar. 4,526,334, Cl. 248-157.000.
Rathke, Willi: *See—*
Hirschmann, Adolf M.; Kaser, Klaus; Rieker, Hans; Busch, Hans-Peter; Rathke, Willi; and Maul, Heinz P., 4,526,294, Cl. 222-47.000.
Raudys, Vytas A., to Union Carbide Corporation. Article for use in automatically and continuously making stuffed casing products. 4,525,895, Cl. 17-1.00R.
Rausch, John J.; and Novy, Russell F., to Material Sciences Corporation; Van Thyne, Ray J.; and Rausch, John J. Process for surface diffusing steel products in coil form. 4,526,817, Cl. 427-431.000.
Ravner, Harold: *See—*
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RCA Corporation: *See—*
Haworth, Robert F., 4,527,286, Cl. 455-601.000.
Lewis, Henry G., Jr., 4,527,188, Cl. 358-23.000.
Sandercock, John R., 4,526,466, Cl. 356-71.000.
Steigmeier, Edgar F.; and Auderset, Heinrich, 4,526,468, Cl. 356-338.000.
Rea, R. Stephen. Celestial globe. 4,526,549, Cl. 434-288.000.
Reading, Christopher: *See—*
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,526,783, Cl. 424-114.000.
Reames, Donovan J.: *See—*
Sears, Billy D.; Holland, Gerald G.; Cazinha, John R.; and Reames, Donovan J., 4,525,956, Cl. 51-241.00S.
Recycled Paper Bedding, Inc.: *See—*
Whiteman, Patrick W., 4,526,325, Cl. 241-73.000.
Redcom Laboratories Inc.: *See—*
Caplan, Jerome S.; Delmege, James W.; Laman, Robert R.; and Navarro, Christine, 4,527,012, Cl. 179-18.0ES.
Redell, Dietrich; and Schmidt, Dieter, to W. Haldenwanger Technische Keramik GmbH & Co. KG. Device for supporting flat ceramic objects to be fired in a continuously heating furnace. 4,526,538, Cl. 432-246.000.
Reed, David A.: *See—*
Donnan, Jeremy F.; and Reed, David A., 4,526,572, Cl. 604-29.000.
Reed, H. David: *See—*
Ceccon, Harry; Murphy, Richard A.; Reed, H. David; and Orringer, Oscar, 4,526,039, Cl. 73-774.000.
Reed, Larry T., to Axia Incorporated. Oxygen sensor. 4,526,672, Cl. 204-428.000.
Reekie, John, to British Nuclear Fuels Limited. Sampling system. 4,526,045, Cl. 73-864.310.
Reese, Walter J.; and Salego, George T., to PPG Industries, Inc. Method and apparatus for forming a bundle of glass filaments. 4,526,598, Cl. 65-3.100.
Reichenberger, Helmut: *See—*
Hassler, Dieter; Kresse, Heinz; Reichenberger, Helmut; and Naser, Georg, 4,526,168, Cl. 128-303.00R.
Reid, Alistair: *See—*
Day, Michael A.; and Reid, Alistair, 4,526,885, Cl. 502-327.000.
Reiff, Thomas F.: *See—*
Hale, Richard A.; Olsson, Nils O.; and Reiff, Thomas F., 4,526,377, Cl. 277-9.000.
Reil, Wilhelm, to Tetra Pak Developpement S.A. Package for flowable materials with foldlines reinforced by strips. 4,526,314, Cl. 229-3.100.
Reiland, Dennis J., to General Foundry Products Corporation. High pressure molding riser. 4,526,338, Cl. 249-197.000.
Reimann, George J., to Mobil Oil Corporation. Apparatus and method for forming and stacking plastic bags. 4,526,639, Cl. 156-182.000.
Reiney, Michael G., to Tektronix, Inc. Signature analysis using random probing and signature memory. 4,527,272, Cl. 371-25.000.
Reinish, Martin D.: *See—*
Parr, Richard S.; Ramachandran, Pallassana N.; Grey, Seymour; and Reinish, Martin D., 4,526,702, Cl. 252-174.250.
Reiser, Carl A.; and Maricle, Donald L., to United Technologies Corporation. Molten carbonate fuel cell integral matrix tape and bubble barrier. 4,526,845, Cl. 429-41.000.
Reissig, George W., to PPG Industries, Inc. Method of controlling article speed during edge grinding. 4,525,958, Cl. 51-283.00E.
Reliance Electric Company: *See—*
Patoray, Stephen A., 4,526,246, Cl. 177-179.000.
Rendoll Paper Corporation: *See—*
Froom, Thomas W., 4,526,563, Cl. 493-151.000.
Repco Limited: *See—*
Kilpatrick, Ewen P., 4,526,328, Cl. 242-107.40A.
Repella, James A., to Microdot Inc. Nested serpentine seal assembly. 4,526,386, Cl. 277-188.00R.
Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Fluorinated vinyl ethers, copolymers thereof, and precursors thereto. 4,526,948, Cl. 526-247.000.
Reuschenbach, Hermann; and Sentinger, Egon, to Stabilus GmbH. Fluid-operated actuating device. 4,526,088, Cl. 92-12.000.
Revlon, Inc.: *See—*
Goldberg, Marvin; and Brandon, Arthur, 4,526,781, Cl. 424-70.000.
Rewitzer, Siegfried, to Hoechst Aktiengesellschaft. Process and device for packing staple fibers into bales. 4,526,094, Cl. 100-35.000.
Rewitzer, Siegfried, to Hoechst Aktiengesellschaft. Process and apparatus for the automatic depositing and pressing of continuous tows. 4,526,095, Cl. 100-39.000.
Reynolds, Andrew J.: *See—*
Harrison, William J.; Reynolds, Andrew J.; Kellaway, Michael J.; MacMichael, Donald B. A.; and Miller, Anne T., 4,526,215, Cl. 141-83.000.
Rheinisch-Westfallisches Elektrizitatswerk Aktiengesellschaft: *See—*
Gebhard, Georg R. U.; Hein, Klaus R. G.; and Glaser, Wolfgang, 4,526,703, Cl. 252-189.000.
Rheotron AG: *See—*
van der Pol, Ronald; and Mertens, Dieter, 4,527,107, Cl. 318-642.000.
Rhodes, James V.: *See—*
Chambers, Colin T.; and Rhodes, James V., 4,527,015, Cl. 179-84.00R.
Rhodes, Tony, to Mattel, Inc. Animated figure toy having a telescoping appendage. 4,526,552, Cl. 446-320.000.
Rhone-Poulenc Chimie De Base: *See—*
Bernard, Philippe; and Prudhon, Francois, 4,526,529, Cl. 431-9.000.
Rhone-Poulenc Sante: *See—*
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,526,962, Cl. 544-016.000.
Rhythm Watch Company Limited: *See—*
Makuta, Shunichi, 4,526,478, Cl. 368-273.000.
Ricards, John D., to Eastman Kodak Company. Magnetic shield and multitrack magnetic head apparatus using same. 4,527,212, Cl. 360-121.000.
Rich, Roy L. Thread cover for protecting a seal. 4,525,915, Cl. 29-423.000.
Richards, Byron A.: *See—*
Newman, Richard W.; Moore, William C.; and Richards, Byron A., 4,526,449, Cl. 351-205.000.
Richardson, Frank B., to Thomas Swan & Co. Ltd. Curing of epoxide resins. 4,526,721, Cl. 260-404.500.
Richert, Manfred, to Marker International Company. Electronic safety ski binding having oblique, orthogonal transducers. 4,526,397, Cl. 280-612.000.
Ricoh Company Ltd.: *See—*
Iwasaki, Kyuhachiro; Ameyama, Minoru; Ebi, Yutaka; Jinnai, Koichiro; and Sato, Tsutomu, 4,527,170, Cl. 346-75.000.
Rieker, Hans: *See—*
Hirschmann, Adolf M.; Kaser, Klaus; Rieker, Hans; Busch, Hans-Peter; Rathke, Willi; and Maul, Heinz P., 4,526,294, Cl. 222-47.000.
Riggs, Robert S.: *See—*
Portalupi, Steven J.; and Riggs, Robert S., 4,526,647, Cl. 156-406.400.
Riker Laboratories, Inc.: *See—*
Scherrer, Robert A.; Stern, Richard M.; and Hammar, Walton J., 4,526,896, Cl. 514-252.000.

Riley, William M., Jr; and Vassmer, Gregory R., to Chicago Rawhide Mfg. Co. Seal having casing unit with contoured annular inner diameter. 4,526,384, Cl. 277-153.000.
Rinehart, Robert E.: *See*—
Lewis, James M.; Owens, Robert A.; Sweeney, Richard F.; Wake, Ronald W.; and Rinehart, Robert E., 4,526,856, Cl. 430-191.000.
Rippel, Harry C.: *See*—
Stahl, Philip; Fuller, Dudley D.; and Rippel, Harry C., 4,526,484, Cl. 384-133.000.
Ritter, Gerhard: *See*—
Ritter, Klaus; Ritter, Gerhard; Schmidt, Gerhard; and Ritter, Josef, 4,526,025, Cl. 72-388.000.
Ritter, Gladys M., executrix: *See*—
Ebenal, Harry R., deceased; and Ritter, Gladys M., executrix, 4,526,167, Cl. 128-158.000.
Ritter, Josef: *See*—
Ritter, Klaus; Ritter, Gerhard; Schmidt, Gerhard; and Ritter, Josef, 4,526,025, Cl. 72-388.000.
Ritter, Klaus; Ritter, Gerhard; Schmidt, Gerhard; and Ritter, Josef, to EVG Entwicklungs- und Verwertungs-Gesellschaft m.b.H. Wire or strip bending mechanism. 4,526,025, Cl. 72-388.000.
Riva, Ermete: *See*—
Sisti, Giorgio; Trestiano, Sorin; and Riva, Ermete, 4,526,686, Cl. 210-198.200.
Robert Bosch GmbH: *See*—
Djordjevic, Ilija; and Eheim, Franz, 4,526,146, Cl. 123-357.000.
Fischer, Werner; Flaig, Ulrich; Hettich, Gerhard; and Locher, Johannes, 4,527,121, Cl. 324-207.000.
Grob, Ferdinand, 4,526,147, Cl. 123-440.000.
Guntert, Josef; Hafele, Walter; Pfeifle, Helmut; Schwartz, Reinhard; and Straubel, Max, 4,526,150, Cl. 123-447.000.
Hafele, Walter; Pfeifle, Helmut; Schwartz, Reinhard; and Straubel, Max, 4,526,149, Cl. 123-447.000.
Leiber, Heinz, 4,526,003, Cl. 60-534.000.
Leiber, Heinz, 4,526,203, Cl. 137-627.500.
Seifert, Kurt, 4,526,323, Cl. 239-453.000.
Robinson, James R.: *See*—
Vincent, Arthur L; Robinson, James R.; and Ginkel, Ernst R., 4,526,755, Cl. 422-90.000.
Robinson, Joseph G.; and Barnes, David I., to Coal Industry (Patents) Ltd. Process for the production of ZSM-5 zeolite. 4,526,767, Cl. 423-329.000.
Roblejo, Conrad. Hydropropulsion catheter and method for removing urinary blockages. 4,526,575, Cl. 604-54.000.
Rocheleau, Richard E.: *See*—
Hall, Robert B.; and Rocheleau, Richard E., 4,526,809, Cl. 427-74.000.
Rockwell International Corporation: *See*—
Goss, Joseph R.; and Schulz, David W., 4,526,312, Cl. 228-157.000.
Grantham, LeRoy F.; and Ashworth, Joseph A., 4,526,677, Cl. 208-262.000.
McElreath, Kenneth W.; and Fabian, Gordon R., 4,527,242, Cl. 364-434.000.
Niemiro, Thaddeus A.; and Machaj, Daniel F., 4,526,099, Cl. 101-220.000.
Rode, Henry J. Truck body cover. 4,526,416, Cl. 296-100.000.
Rogers, David P.; and Geisel, Donald J., to Testamatic, Incorporated. High speed, low mass, movable probe and/or instrument positioner, tool and like items suitable for use in a controlled environment chamber. 4,527,119, Cl. 324-158.00F.
Rogers, Thomas E.: *See*—
Coleman, James P.; Hallcher, Richard C.; Rogers, Thomas E.; and McMackins, Dudley E., 4,526,990, Cl. 549-326.000.
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, to Benckiser-Knapsack GmbH. Method for bleaching cellulose fibers with N-(hydroxy methyl)-1-amino alkane-1,1-diphosphonic acid stabilized peroxide-containing bleaching baths. 4,526,582, Cl. 8-107.000.
Rohm and Haas Company: *See*—
Prentiss, William C.; and Price, David N., 4,526,581, Cl. 8-94.330.
Rolls-Royce Limited: *See*—
Wright, William B.; and Pidcock, Anthony, 4,525,996, Cl. 60-39.310.
Romanenko, Oleg N.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.
Rombrecht, Hans M.: *See*—
Zeitler, Gerhard; Bittner, Gerhard; Faehndrich, Knud; and Rombrecht, Hans M., 4,526,952, Cl. 524-496.000.
Rompf, Kurt: *See*—
Preis, Lothar; Hoffmann, Jurgen; and Rompf, Kurt, 4,526,492, Cl. 403-268.000.
Ronay, Maria: *See*—
Latta, Ernst-Eberhard; and Ronay, Maria, 4,526,629, Cl. 148-1.500.
Roper Corporation: *See*—
Lane, Joseph J.; and Scanland, Joseph E., 4,525,989, Cl. 56-17.400.
Roper, Stephen J., to Pennsylvania Engineering Corporaton. Deslagging rake. 4,526,352, Cl. 266-228.000.
Rose, Robert M.: *See*—
Kuehnle, Manfred R.; Rose, Robert M.; and Ballas, John S., 4,526,357, Cl. 271-18.200.
Rosen, Stanley D.; and Ross, William D., to Ford Motor Company. Automatic transmission brake-neutral control circuit. 4,526,065, Cl. 74-869.000.
Rosenbach, Klaus: *See*—
Popp, Franz-Wolfgang; and Rosenbach, Klaus, 4,527,065, Cl. 250-506.100.
Rosenberg, Burkard, to Bell Maschinenfabrik Aktiengesellschaft. Dewatering of naturally moist crude peat. 4,526,607, Cl. 71-24.000.
Rosenwinkel, Donald A.; Breslow, Jeffrey D.; and Zaruba, John V., to Marvin Glass & Associates. Game with cards. 4,526,376, Cl. 273-249.000.
Ross, Barry C.; Johnson, Graham; and Yeomans, Michael A., to Hoechst UK Limited. 3,3-Di(acylthio)-2(4-allylthioazetidin-2-on-1-yl)propenoic acid ester compounds. 4,526,718, Cl. 260-239.00A.
Ross, Ludwig: *See*—
Grabowski geb. Marszalek, Danuta; Ross, Ludwig; Geiler, Volkmar; and Mennemann, Karl, 4,526,874, Cl. 501-77.000.
Ross, William D.: *See*—
Rosen, Stanley D.; and Ross, William D., 4,526,065, Cl. 74-869.000.
Rosseau, Richard B.: *See*—
Bargiel, Douglas A.; Assony, Edward M.; Ha, Truong M.; and Rosseau, Richard B., 4,525,888, Cl. 15-83.000.
Rottger, Klaus, to Siemens Aktiengesellschaft. Adjacent radio cells paging channel chaining system. 4,527,284, Cl. 455-33.000.
Rowland, Gerald, to Klargester Environmental Engineering Ltd. Waste water treatment plant. 4,526,685, Cl. 210-138.000.
Rowland-Hill, E. William: *See*—
Sheehan, Ronald T.; Rowland-Hill, E. William; and Bohman, Carl E., 4,527,241, Cl. 364-424.000.
Rozansky, Boris: *See*—
Midland, Richard W.; and Rozansky, Boris, 4,527,192, Cl. 358-67.000.
Rozmus, Walter J., to Kelsey-Hayes Company. Hot consolidation of powder metal-floating shaping inserts. 4,526,748, Cl. 419-49.000.
Rubin, David, to Century Laboratories, Inc. Combined fatty acid composition for treatment or prophylaxis of thrombo-embolic conditions. 4,526,902, Cl. 514-560.000.
Rubin, Fred K., to Lever Brothers Company. Dye stabilized detergent compositions. 4,526,701, Cl. 252-113.000.
Rudakov, Viktor A.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.
Rudy, Michael A.; and Jacob, Joseph. Electronic anatomical probe. 4,526,177, Cl. 128-737.000.
Ruf, Walter; and Kelley, Robert G., to St. Regis Corporation. Force balancing weighing system. 4,526,245, Cl. 177-160.000.
Ruhland, Hans: *See*—
Fuchs, Dieter; and Ruhland, Hans, 4,526,383, Cl. 277-152.000.
Ruhrchemie Aktiengesellschaft: *See*—
Lusch, Jurgen; Heinen, Heinrich; Lieder, Bernhard; Schmidt, Volkmar; and Kolodzey, Wolfgang, 4,526,588, Cl. 48-202.000.
Ruiz, Ariel: *See*—
Borne, Andre ; Marmonier, Andre ; and Ruiz, Ariel, 4,526,435, Cl. 339-103.00C.
Rumbach, Karl F., to Agrob Anlagenbau GmbH. Apparatus for heat treatment of material in pieces at high temperature. 4,526,537, Cl. 432-239.000.
Runkel, Manfred A.; Hsu, William W.; Singer, Anthony E.; and Zlotski, William J., to HR Textron Inc. Centering and lock mechanism for hydraulic actuator. 4,526,058, Cl. 74-531.000.
Runnels, Russell W. Aircraft collision pilot warning indicating system. 4,527,158, Cl. 340-961.000.
Rupp, Walter: *See*—
Finke, Manfred; Rupp, Walter; and Weiss, Erwin, 4,526,728, Cl. 260-502.50R.
Rusiecki, Eugene R.: *See*—
Box, William A.; and Rusiecki, Eugene R., 4,526,038, Cl. 73-644.000.
Rusk, Chris E. Writing aid and method of teaching using the writing aid. 4,526,547, Cl. 434-166.000.
Russell, James L., to Arinc Research Corporation. Correlation data communications system. 4,527,275, Cl. 375-1.000.
Russello, Thomas: *See*—
Sangiamo, Richard; and Russello, Thomas, 4,527,224, Cl. 362-282.000.
Ruth, George F., Jr. Mud walker. 4,525,941, Cl. 36-116.000.
Rutledge, Raleigh N.: *See*—
Searl, Alonzo H.; Hahn, Granville J.; and Rutledge, Raleigh N., 4,526,736, Cl. 264-53.000.
Ryadchikov, Vladimir E.: *See*—
Bykov, Anatoly P.; Orlov, Anatoly A.; Gribanov, Dmitry D.; Kulesh, Vladimir P.; Fonov, Sergei D.; Egorov, Vitaly V.; Moskalik, Leonid M.; Martynov, Apollinary K.; and Ryadchikov, Vladimir E., 4,526,471, Cl. 356-373.000.
Ryan, Charles P.; Guenthner, Russell W.; and Trubisky, Leonard G., to Honeywell Information Systems Inc. Cache with independent addressable data and directory arrays. 4,527,238, Cl. 364-200.000.
Ryan, Charles T.; Scheuerlein, Roy E.; and Kasprzak, Lucian A., to International Business Machines Corporation. Dynamic random access memory having separated V_{DD} pads for improved burn-in. 4,527,254, Cl. 365-51.000.

Ryan, Kevin P.; and Yank, Carl D., to ERCO Industries Limited. Production of red phosphorus. 4,526,766, Cl. 423-322.000.

Ryobi Limited: *See*—
Sazaki, Kounin, 4,526,327, Cl. 242-84.20G.

S.N.E.C.M.A.: *See*—
d'Agostino, Guy; Dhainaut, Andre; and Maillard, Claude M. J., 4,526,087, Cl. 91-61.000.

S.O.C. Corporation: *See*—
Arikawa, Hiroo, 4,527,144, Cl. 337-407.000.

Saam, Richard D.: *See*—
Melis, William; and Saam, Richard D., 4,526,691, Cl. 210-521.000.

Saar, David A.: *See*—
Zavis, Wayne; and Saar, David A., 4,527,101, Cl. 318-245.000.

Saarela, Markku T.: *See*—
Blomquist, Seppo I.; Saarela, Markku T.; Pouru, Hannu J.; Nyman, Bror G.; Lindroos, Kaj-Henrik; Koivunen, Timo T.; and Fugleberg, Sigmund P., 4,526,650, Cl. 156-642.000.

Sacher, Robert L.; and Sacher, William J., to R. P. Cargille Laboratories, Inc. High refractive index fluid and melt mounting media. 4,526,711, Cl. 252-582.000.

Sacher, William J.: *See*—
Sacher, Robert L.; and Sacher, William J., 4,526,711, Cl. 252-582.000.

Sachs, Isaac. Multi-strand cable clamp with positive strand engagement. 4,526,428, Cl. 339-14.00R.

Sagawa, Toshiaki: *See*—
Miyanaka, Motoshi; Toudo, Kenzi; and Sagawa, Toshiaki, 4,527,125, Cl. 328-6.000.

St. John, Karl M.; and Zagardo, Dominic V., to Hazeltine Corporation. Image storage system. 4,527,193, Cl. 358-76.000.

St. Regis Corporation: *See*—
Ruf, Walter; and Kelley, Robert G., 4,526,245, Cl. 177-160.000.

Saintherant, Patrice: *See*—
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Saito, Susumu: *See*—
Owaki, Isao; Saito, Susumu; Fujii, Yasuhiko; and Nakamura, Shinji, 4,527,207, Cl. 360-73.000.

Saji, Ikutaro; Sato, Renzo; Hanma, Noritaka; and Motoike, Yasuo, to Sumitomo Chemical Company, Limited. Process for preparing optically active imidazolylpropanol compounds, and intermediate therein. 4,526,983, Cl. 548-341.000.

Sakakibara, Shiro; and Kawamoto, Mutsumi, to Aisin-Warner Kabushiki Kaisha. Stepless automatic transmission for motor vehicles. 4,526,061, Cl. 74-689.000.

Sakakibara, Shiro; and Kawamoto, Mutsumi, to Aisin-Warner Kabushiki Kaisha. Stepless automatic transmission for motor vehicles. 4,526,062, Cl. 74-689.000.

Sakamoto, Kazuhiko: *See*—
Imazaki, Hideyuki; and Sakamoto, Kazuhiko, 4,526,932, Cl. 525-326.700.

Sakashita, Takeshi; Inagaki, Hajime; Todo, Akira; and Nakano, Takayuki, to Mitsui Petrochemical Industries, Ltd. Curable coating composition containing acryloyl or methacryloyl cyanurate or isocyanurate compound, cured composition therefrom, and process for producing articles by using the curable composition. 4,526,920, Cl. 524-850.000.

Sakaue, Yoshinori: *See*—
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,527,174, Cl. 346-136.000.
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,527,176, Cl. 346-141.000.

Sakurai, Hisaya; Ikegami, Tadashi; Miya, Masayoshi; and Takaya, Katsuhiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Polymerization of olefins. 4,526,941, Cl. 526-127.000.

Sakurai, Kenji: *See*—
Yamamoto, Yoshihiro; and Sakurai, Kenji, 4,526,875, Cl. 501-87.000.

Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikazu; and Shibata, Akiyoshi, to Mitsubishi Gas Chemical Company, Inc. Acetal resin composition. 4,526,921, Cl. 524-405.000.

Salego, George T.: *See*—
Reese, Walter J.; and Salego, George T., 4,526,598, Cl. 65-3.100.

Salesky, Leonard, to Salesky, Leonard; and Farber, Phyllis S. Digital apical foramen locating apparatus. 4,526,179, Cl. 128-776.000.

Saligny, Yves, to Carpano & Pons. Connecting element. 4,526,434, Cl. 339-99.00R.

Salvati, Patricia; Caravaggi, Anna M.; Temperilli, Aldemio; Bosisio, Germano; Sapini, Osvaldo; and di Salle, Enrico, to Farmitalia Carlo Erba, S.p.A. Dimethylaminoalkyl-3-(ergoline-8′ßcarbonyl)-ureas. 4,526,892, Cl. 514-288.000.

Salvatore, Amedeo: *See*—
De Filippis, Pietro; Salvatore, Amedeo; Calenda, Ciro; and Notaro, Giuseppe, 4,527,142, Cl. 337-105.000.

Samala, Fred, to Topps Chewing Gum, Incorporated. Chewing gum product. 4,526,790, Cl. 426-5.000.

Samas, Mark V.: *See*—
Kies, Anton M.; and Samas, Mark V., 4,526,496, Cl. 408-179.000.

Sammens, Bo, to Sammens, Bo. Apparatus for automatically packaging articles. 4,525,985, Cl. 53-497.000.

Samson, Rogelio G.: *See*—
Hideg, Laszlo; Koller, Paul L.; and Samson, Rogelio G., 4,526,152, Cl. 123-478.000.

Sandercock, John R., to RCA Corporation. Technique for verifying genuineness of authenticating device. 4,526,466, Cl. 356-71.000.

Sanderson, John R.: *See*—
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Sandoz Ltd.: *See*—
Brunet, Michel, 4,526,302, Cl. 222-321.000.
Deur, Michel, 4,526,963, Cl. 544-74.000.
Fleck, Fritz; Mercer, Alec V.; and Oates, Malcolm, 4,526,976, Cl. 548-159.000.

Sangiamo, Richard; and Russello, Thomas, to Keene Corporation. Mounting for high intensity light fixture. 4,527,224, Cl. 362-282.000.

Sano, Eiichi: *See*—
Suzuki, Toru; Sano, Eiichi; and Hanamura, Yoshihiko, 4,526,450, Cl. 351-206.000.

Sano, Keizo: *See*—
Miyoshi, Takehiko; Matsumoto, Tadayuki; and Sano, Keizo, 4,526,738, Cl. 264-176.00F.

Sanofi: *See*—
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Santen, Sven: *See*—
Eriksson, Sune; and Santen, Sven, 4,526,612, Cl. 75-10.00R.

Santostasi, Paul A.: *See*—
Dutt, Herbert V.; and Santostasi, Paul A., 4,526,282, Cl. 215-252.000.

Sapini, Osvaldo: *See*—
Salvati, Patricia; Caravaggi, Anna M.; Temperilli, Aldemio; Bosisio, Germano; Sapini, Osvaldo; and di Salle, Enrico, 4,526,892, Cl. 514-288.000.

Sapivog: *See*—
Fort, Jacques, 4,526,363, Cl. 271-268.000.

Sapp, Charles. Automatic fish feeding apparatus. 4,526,134, Cl. 119-51.130.

Sasa, Hiroyuki: *See*—
Ishii, Fumiaki; Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Takamura, Koji; and Nakamura, Takeaki, 4,526,623, Cl. 134-21.000.
Takamura, Koji; Ishii, Fumiaki; Nakajima, Yukio; Yabe, Hisao; Sasa, Hiroyuki; and Nakamura, Takeaki, 4,526,622, Cl. 134-21.000.

Sasaki, Masao: *See*—
Nishijima, Toyoki; Sasaki, Masao; and Onodera, Kaoru, 4,526,853, Cl. 430-139.000.

Sasaki, Nobuo, to Fujitsu Limited. High density semiconductor memory array and method of making same. 4,527,181, Cl. 357-23.700.

Sase, Masatoshi: *See*—
Onga, Makoto; Sase, Masatoshi; and Yamanaka, Seisuke, 4,527,190, Cl. 358-30.000.

Sato, Akihiro: *See*—
Chiba, Hiromasa; Harada, Takakiyo; Kumahara, Katsumi; Kawazoe, Shunji; and Sato, Akihiro, 4,526,931, Cl. 525-268.000.

Sato, Kazuhiro; Kumagai, Takashi; Ishizuka, Takuo; and Ishizuka, Tadatsugu, to Hitachi, Ltd. Data searching apparatus. 4,527,253, Cl. 364-900.000.

Sato, Kazuo, to Clarion Co., Ltd. Film deposition equipment. 4,526,802, Cl. 427-8.000.

Sato, Keiichi; Takeuchi, Yoko; and Yanagisawa, Midori, to Sony/Tektronix Corporation. Method of controlling a set point. 4,527,230, Cl. 364-130.000.

Sato, Makoto; and Fujii, Etsuo, to Honda Giken Kogyo Kabushiki Kaisha. Anti-lock braking system and associated method. 4,526,426, Cl. 303-6.00C.

Sato, Renzo: *See*—
Saji, Ikutaro; Sato, Renzo; Hanma, Noritaka; and Motoike, Yasuo, 4,526,983, Cl. 548-341.000.

Sato, Teiji: *See*—
Usui, Koichi; Sato, Teiji; and Tanaka, Masanori, 4,527,178, Cl. 346-207.000.

Sato, Tsutomu: *See*—
Iwasaki, Kyuhachiro; Ameyama, Minoru; Ebi, Yutaka; Jinnai, Koichiro; and Sato, Tsutomu, 4,527,170, Cl. 346-75.000.

Sato, Yasuo; Fukushima, Akio; Kaise, Toshiro; Honda, Yoshiyuki; Uemura, Kazuho; and Fujii, Manabu, to Mitsubishi Denki Kabushiki Kaisha. Separation type air conditioner. 4,526,010, Cl. 62-126.000.

Sato, Yuichi: *See*—
Kinoshita, Takao; Tsunekawa, Tokuichi; and Sato, Yuichi, 4,527,199, Cl. 358-213.000.

Satou, Hiroshi: *See*—
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,526,610, Cl. 75-0.5BC.

Saurwein, Albert C., to McCartney Manufacturing Co., Inc. Pressure intensifier. 4,526,000, Cl. 60-540.000.

Savenije, Franciscus G., to Auping B. V. Body support adapted to differing volume to weight ratios. 4,525,886, Cl. 5-464.000.

Sawada, Yasuhiro: *See*—
Kawamura, Reiki; Tanaka, Takuo; Asano, Toshio; and Sawada, Yasuhiro, 4,526,420, Cl. 297-218.000.

Sazaki, Kounin, to Ryobi Limited. Fishing spinning reel. 4,526,327, Cl. 242-84.20G.

Scanland, Joseph E.: *See*—
Lane, Joseph J.; and Scanland, Joseph E., 4,525,989, Cl. 56-17.400.

Scarr, Roger; and Fearon, Edward R., to Shin International, Inc. Anti-shoplifting system. 4,527,152, Cl. 340-572.000.

Scarton, Henry A.: *See*—
Braun, Alfred J.; Burdick, Aron; and Scarton, Henry A., 4,526,729, Cl. 261-36.00A.

Schachar, Ronald A. Cornea incision device. 4,526,171, Cl. 128-305.000.

Schadt, Martin: *See*—
Petrzilka, Martin; Schadt, Martin; and Villiger, Alois, 4,526,704, Cl. 252-299.610.

Schaefer, David A., to Adsco Manufacturing Corp. Expansion joint. 4,526,409, Cl. 285-114.000.

Schaeffer, Merle J., to National Geographic Society. Fully rotational illuminated globe. 4,526,546, Cl. 434-145.000.

Schaetzke, Ulrike: *See*—
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,526,582, Cl. 8-107.000.

Schafer, Horst, to Semikron Gesellschaft fur Gleichrichterbau und Elektronik. Method for producing a plurality of semiconductor circuits. 4,525,924, Cl. 29-580.000.

Schappert, Raymond F.: *See*—
Das, Suryya K.; Greigger, Paul P.; Boberski, William G.; Jones, James E.; Schappert, Raymond F.; and Seiner, Jerome A., 4,526,910, Cl. 523-220.000.

Scharf, Gunther: *See*—
Merchant, Harish D.; Morris, James G.; and Scharf, Gunther, 4,526,625, Cl. 148-2.000.

Schedele, Helmut, to Siemens Aktiengesellschaft. Electromagnetic rotating armature relay. 4,527,138, Cl. 335-81.000.

Schegolev, Vladimir I.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.

Schellhammer, Carl-Wolfgang: *See*—
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Schelter, Heinrich: *See*—
Heinrich, Juergen; Schelter, Heinrich; Schindler, Stefan; and Krauth, Axel, 4,526,635, Cl. 156-89.000.

Scherer, John R. Method for improving performance of chaplets in metal casting. 4,526,220, Cl. 164-137.000.

Scherf, Thomas W.: *See*—
La Barge, Robert L.; Scherf, Thomas W.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Pohlenz, Elmer E., 4,526,096, Cl. 100-53.000.

Schering, Aktiengesellschaft: *See*—
Niedballa, Ulrich; and Gries, Heinz, 4,526,994, Cl. 549-451.000.

Scherrer, Robert A.; Stern, Richard M.; and Hammar, Walton J., to Riker Laboratories, Inc. Tetrazol-5-yl 2-nitro-3-phenylbenzofurans and antimicrobial use thereof. 4,526,896, Cl. 514-252.000.

Schettino, Anthony J.: *See*—
Johnson, Bruce K.; and Schettino, Anthony J., 4,526,453, Cl. 354-181.000.

Scheuerlein, Roy E.: *See*—
Ryan, Charles T.; Scheuerlein, Roy E.; and Kasprzak, Lucian A., 4,527,254, Cl. 365-51.000.

Schiemann, Wolfram. Screw stopper for a can. 4,526,289, Cl. 220-304.000.

Schierling, Bernhard, to Fichtel & Sachs AG. Torque transmission device. 4,526,260, Cl. 192-106.200.

Schimanski, Georg: *See*—
von Philipp, Fritz; and Schimanski, Georg, 4,526,320, Cl. 239-43.000.

Schimmel, William P.; Barker, Clifford S.; and Jones, Dana P., to Williams International Corporation. Process for fabricating parts such as gas turbine compressors. 4,526,747, Cl. 419-8.000.

Schindler, Stefan: *See*—
Heinrich, Juergen; Schelter, Heinrich; Schindler, Stefan; and Krauth, Axel, 4,526,635, Cl. 156-89.000.

Schlage Lock Company: *See*—
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Schlosser, Hans-Joachim: *See*—
Herrmann, Heinz; and Schlosser, Hans-Joachim, 4,526,852, Cl. 430-115.000.

Schlumberger Technology Corporation: *See*—
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Schmidt, Dieter: *See*—
Redell, Dietrich; and Schmidt, Dieter, 4,526,538, Cl. 432-246.000.

Schmidt, George S., to General Electric Company. Double lift jack. 4,526,345, Cl. 254-93.00R.

Schmidt, Gerhard: *See*—
Ritter, Klaus; Ritter, Gerhard; Schmidt, Gerhard; and Ritter, Josef, 4,526,025, Cl. 72-388.000.

Schmidt, Henry, Jr.; Cederholm, Allen E.; and Zievers, James F., to Industrial Filter & Pump Mfg. Co. Pressure filter with vibratory impactor. 4,526,688, Cl. 210-323.200.

Schmidt, Hubert, to Lermer Apparatebau GmbH. Brake for rollable receiving elements utilized particularly in airplanes. 4,526,253, Cl. 188-1.120.

Schmidt, Robert C., Jr.; and Puletti, Paul P., to National Starch and Chemical Corporation. Disposable article constructions. 4,526,577, Cl. 604-366.000.

Schmidt, Volkmar: *See*—
Lusch, Jurgen; Heinen, Heinrich; Lieder, Bernhard; Schmidt, Volkmar; and Kolodzey, Wolfgang, 4,526,588, Cl. 48-202.000.

Schmitt, Dallas L.: *See*—
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Schnettler, Richard A.: *See*—
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Scholin, Bertil: *See*—
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Scholz, Manfred: *See*—
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Schott Glaswerke: *See*—
Grabowski geb. Marszalek, Danuta; Ross, Ludwig; Geiler, Volkmar; and Mennemann, Karl, 4,526,874, Cl. 501-77.000.

Schriever, Matthias P.; and Wong, Chun-Ming, to Boeing Company, The. Method of making peelable non-metallic shims. 4,526,641, Cl. 156-247.000.

Schroder, Gunter, to Deutsche Gesellschaft etc. Method for carrying out repair, maintenance or testing apparatus, components and the like in hot cells. 4,526,311, Cl. 228-119.000.

Schroeder, Philip W., to J. I. Case Company. Dual wheel mounting arrangement. 4,526,425, Cl. 301-36.00R.

Schroer Manufacturing Co., Inc.: *See*—
LoMaglio, F. Leo, 4,526,133, Cl. 119-17.000.

Schuld, Leo A. Remote controlled cover and mounting means therefore. 4,526,288, Cl. 220-264.000.

Schulman, Marvin: *See*—
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Schulp, Philip P.: *See*—
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Schulz, David W.: *See*—
Goss, Joseph R.; and Schulz, David W., 4,526,312, Cl. 228-157.000.

Schulz, Gunter; and Bothner, Jakob, to Zinser Textilmaschinen GmbH. Filament drawing frame with variable roller-pair spacing. 4,525,897, Cl. 19-260.000.

Schwab, Arthur W.; and Pryde, Everett H., to United States of America, Agriculture. Microemulsions from vegetable oil and aqueous alcohol with 1-butanol surfactant as alternative fuel for diesel engines. 4,526,586, Cl. 44-53.000.

Schwabe, Ulrich: *See*—
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Schwartz, Harry D.: *See*—
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Schwartz, Reinhard: *See*—
Guntert, Josef; Hafele, Walter; Pfeifle, Helmut; Schwartz, Reinhard; and Straubel, Max, 4,526,150, Cl. 123-447.000.
Hafele, Walter; Pfeifle, Helmut; Schwartz, Reinhard; and Straubel, Max, 4,526,149, Cl. 123-447.000.

Schwartz, Samuel, to University of Minnesota, Regents of the. Method for quantitatively determining the concentration of hemoglobin in a biological sample. 4,526,869, Cl. 436-66.000.

Schwarz, Claude R.: *See*—
Gilman, Robert F.; and Schwarz, Claude R., 4,527,123, Cl. 324-254.000.

Schwarz, Frederick M., to United Technologies Corporation. Clearance control for gas turbine engine. 4,525,998, Cl. 60-226.100.

Schwarz, Gunter. Ski guard. 4,526,402, Cl. 280-817.000.

Schwarzler, Peter: *See*—
Mautner, Franz; Schwarzler, Peter; and Mittermaier, Manfred, 4,526,107, Cl. 105-133.000.

Schwer, John W. Method and article of manufacture for controlling slag carry-over during tapping of a heat in steelmaking. 4,526,349, Cl. 266-45.000.

SCM Corporation: *See*—
Carlson, Gary M.; and Abbey, Kirk J., 4,526,945, Cl. 526-145.000.

Scott, Loren W., to Toro Company, The. Irrigation controller. 4,526,198, Cl. 137-624.200.

Scott, Richard D., to HR Textron Inc. Fluid delivery system incorporating elastomeric check valve. 4,526,189, Cl. 137-68.00A.

Scott, William A.; and Penner, Bernard, to Keith Industries Incorporated. Straw chopper and spreader assembly. 4,526,180, Cl. 130-27.00R.

Seamon, Glen R.: *See*—
Forbush, Donald C.; and Seamon, Glen R., 4,526,771, Cl. 423-543.000.

Searl, Alonzo H.; Hahn, Granville J.; and Rutledge, Raleigh N., to Cosden Technology, Inc. Process and apparatus for manufacturing flexible foamed articles. 4,526,736, Cl. 264-53.000.

Sears, Billy D.; Holland, Gerald G.; Cazinha, John R.; and Peames, Donovan J., to United States of America, Navy. In-situ annular face grinder. 4,525,956, Cl. 51-241.00S.

Sedgwick, Grant O.: *See*—
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Sedlmair, Gerhard, to Marker International. Touring ski binding. 4,526,398, Cl. 280-615.000.

Seebohm, Robert: *See*—
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Seefluth, Charles L. Polymer slurry washing. 4,526,684, Cl. 210-104.000.

Segawa, Yasuhiko: *See*—
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Seguin, Marc: *See—*
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Seikosha Co., Ltd.: *See—*
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Seiner, Jerome A.: *See—*
Das, Suryya K.; Greigger, Paul P.; Boberski, William G.; Jones, James E.; Schappert, Raymond F.; and Seiner, Jerome A., 4,526,910, Cl. 523-220.000.
Seipke, Gerhard; and Tripier, Dominique, to Hoechst Aktiengesellschaft. Polypeptide having an action on the immunological system, processes for its isolation and purification, its use, agents containing this compound, and its cleavage products, their use and agents containing these products. 4,526,717, Cl. 260-112.50R.
Seitz, James P.; and Zara, Rodger A., to NWL Transformers. Support assembly for a high voltage DC power supply. 4,527,221, Cl. 361-379.000.
Seitz, Rudolf, to Flabeg GmbH. Electrically heatable backing means for mirrors. 4,527,047, Cl. 219-219.000.
Sekiguchi, Fumio: *See—*
Okita, Shin; Shimizu, Hideo; Yamazaki, Noriyuki; Sekiguchi, Fumio; Chimura, Toshihiko; and Shinagawa, Osamu, 4,527,208, Cl. 360-85.000.
Sekine, Masaru: *See—*
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Sekine, Yukio: *See—*
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Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Wet adhesion promoters for emulsion polymers. 4,526,915, Cl. 524-83.000.
Selin, Johan; Huttunen, Jouko; Turunen, Olli; Eklund, Vidar; and Ekman, Kurt, to Neste Oy. Cellulose carbamate solutions. 4,526,620, Cl. 106-203.000.
Sellstedt, John H.: *See—*
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Semiatin, Sheldon L.: *See—*
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Semiconductor Energy Laboratory Co., Ltd.: *See—*
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Semikron Gesellschaft fur Gleichrichterbau und Elektronik: *See—*
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Seminole Energy Tools, Inc.: *See—*
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Sentinger, Egon: *See—*
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Sentronic of California Incorporated: *See—*
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Setescak, Linda L.: *See—*
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Setty, H. S. Nagaraja: *See—*
Ingle, William M.; Peffley, Marilyn S.; and Setty, H. S. Nagaraja, 4,526,769, Cl. 423-342.000.
Seufert, Frederick B., to Texaco Development Corporation. Integrated H-oil process including recovery and treatment of vent and purge gas streams and soot-naphtha stream. 4,526,676, Cl. 208-58.000.
Seymour, John P.; and Gannon, John A., to Ciba-Geigy Corporation. Hydroxyl terminated polyfunctional epoxy curing agents. 4,526,940, Cl. 525-526.000.
Shah, Nayan S.: *See—*
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Shah, Raj: *See—*
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Shankar, Srinivasan; and Goward, G. William, to Turbine Components Corporation. Methods of forming a protective diffusion layer on nickel, cobalt, and iron base alloys. 4,526,814, Cl. 427-253.000.
Sharp, Donald W., to Clack, Reynalda. Adjustable roof jack. 4,526,091, Cl. 98-39.100.
Sharp Kabushiki Kaisha: *See—*
Arai, Nobushige, 4,526,162, Cl. 126-450.000.
Shasuzzaman, Kazi M.; and Haard, Norman F. Rennet substitute from seals for making cheese. 4,526,868, Cl. 435-226.000.
Sheehan, Joseph C. M., to Kells Medical, Inc. Skin closure device. 4,526,173, Cl. 128-335.000.
Sheehan, Ronald T.; Rowland-Hill, E. William; and Bohman, Carl E., to Sperry Corporation. Automatic combine harvester adjustment system. 4,527,241, Cl. 364-424.000.
Shell Offshore Inc.: *See—*
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Shell Oil Company: *See—*
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Shellman, Jon V.: *See—*
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Shepherd, Robin G., to John Wyeth & Brother Limited. Preparation of tetrahydroquinolines and related compounds. 4,526,970, Cl. 546-169.000.
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Shibata, Akiyoshi: *See—*
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Shiken, Ltd.: *See—*
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Shikishima Boseki Kabushiki Kaisha: *See—*
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Shima Idea Center Co., Ltd.: *See—*
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Shima, Masahiro, to Shima Idea Center Co., Ltd. Knitting density adjusting method. 4,526,017, Cl. 66-71.000.
Shimadzu Corporation: *See—*
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Shimamura, Isao: *See—*
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Shimizu, Akihiko: *See—*
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Shimizu, Isamu: *See—*
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Shimizu, Tokuzo, to Teac Corporation. Tape cassette having removable reels. 4,526,330, Cl. 242-199.000.
Shin-Etsu Polmer Co., Ltd.: *See—*
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Okita, Shin; Shimizu, Hideo; Yamazaki, Noriyuki; Sekiguchi, Fumio; Chimura, Toshihiko; and Shinagawa, Osamu, 4,527,208, Cl. 360-85.000.
Shinkawa Ltd.: *See—*
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Shinohara, Hiroshi; and Nagai, Kiyoshi, to Taiyo Sanso Co., Ltd. Method and apparatus for vacuum sealing a vacuum container assembly. 4,527,042, Cl. 219-121.0LC.
Shinoura, Osamu: *See—*
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Shirahata, Ryuji; Sekine, Masaru; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording medium manufacturing apparatus. 4,526,131, Cl. 118-718.000.
Shiraishi, Yasuhiro, to Nissan Motor Company, Limited. Automatic windshield wiper speed control with piezoelectric sensor. 4,527,105, Cl. 318-444.000.
Shoji, Takeshi: *See—*
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Shoji, Toshio: *See—*
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Shoor, Bernard A.; and Fulwyler, Mack J., to Becton, Dickinson and Company. Apparatus and method for sorting particles by gas actuation. 4,526,276, Cl. 209-552.000.
Shubkin, Ronald L.: *See—*
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Shudo, Yasunobu; Kano, Masayoshi; Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, to Hitachi Shipbuilding & Engineering Co., Ltd. Ship for treating coal slurry. 4,526,121, Cl. 114-73.000.
Shultz, Julius, to Dax Manufacturers Inc. Gallery frame. 4,525,945, Cl. 40-152.000.
Siasprint S.r.l.: *See—*
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Siebert, Elisabeth: *See—*
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Siegfried Aktiengesselschaft: *See*—
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Siemens Aktiengesellschaft: *See*—
Brockmann, Sigismund; and Gottschalk, Ingo, 4,527,029, Cl. 200-148.00B.
Fischer, Franz, 4,527,184, Cl. 357-67.000.
Geffcken, Walter; and Littwin, Burkhard, 4,527,100, Cl. 315-366.000.
Hassler, Dieter; Kresse, Heinz; Reichenberger, Helmut; and Naser, Georg, 4,526,168, Cl. 128-303.00R.
Haussmann, Wolfgang; and Luder, Rainer, 4,527,145, Cl. 358-19.000.
Jacobs, Erwin P., and Schwabe, Ulrich, 4,525,920, Cl. 29-571.000.
Koslar, Manfred, 4,527,118, Cl. 324-133.000.
Olsson, Sven-Gunnar; Jonson, Bjorn; and Neuman, Hanna, 4,526,188, Cl. 137-3.000.
Rottger, Klaus, 4,527,284, Cl. 455-33.000.
Schedele, Helmut, 4,527,138, Cl. 335-81.000.
Signetics Corporation: *See*—
Keshtbod, Parviz, 4,527,255, Cl. 365-154.000.
Smith, Douglas D., 4,527,078, Cl. 307-475.000.
Silber, Arthur L. Disconnectible section bandage. 4,526,166, Cl. 128-156.000.
Silman, Robert E., to AMB Systems Corp. Microorganism identification technique. 4,526,865, Cl. 435-35.000.
Silmet Ltd.: *See*—
Zaltsman, Saul, 4,526,472, Cl. 366-108.000.
Silverman, Jerry E.: *See*—
Altomare, Robert E.; Beale, Robert J.; Glicksman, Martin; Hegedus, Elizabeth; Schulman, Marvin; and Silverman, Jerry E., 4,526,794, Cl. 426-258.000.
Glicksman, Martin; Frost, John R.; Silverman, Jerry E.; and Hegedus, Elizabeth, 4,526,799, Cl. 426-553.000.
Silvestri, Victor; and Tang, D. Duan-Lee, to International Business Machines Corporation. Method for forming a void free isolation pattern utilizing etch and refill techniques. 4,526,631, Cl. 148-175.000.
Simmonds Precision Products, Inc.: *See*—
Franklin, Cecil, 4,526,027, Cl. 73-1.00H.
Simon, Udo. Device for storing and dispensing drug doses. 4,526,474, Cl. 368-10.000.
Simpson, Harold G., to Encon Products, Inc. Support spacer apparatus for a built-up roof. 4,525,967, Cl. 52-404.000.
Simpson, Harold G., to Encon Products, Inc. Method and apparatus for assembling standing seam roofs. 4,525,976, Cl. 52-748.000.
Sinclair, Richard G.: *See*—
Erbstoesser, Steven R.; Cooke, Claude E., Jr.; Sinclair, Richard G.; and Epstein, Michael M., 4,526,695, Cl. 252-8.55R.
Singer, Anthony E.: *See*—
Runkel, Manfred A.; Hsu, William W.; Singer, Anthony E.; and Zlotski, William J., 4,526,058, Cl. 74-531.000.
Singer Company, The: *See*—
Beller, Wilbert E.; and Mateja, Edward J., 4,526,041, Cl. 73-861.470.
Brauch, Robert B., 4,526,118, Cl. 112-315.000.
Sippola, Pertti J., to Ra-Shipping Ltd. Oy. Apparatus for coating steel objects with an alloy of zinc and aluminium. 4,526,127, Cl. 118-54.000.
Sirazi, Semir, to Zenith Electronics Corporation. Channel assignment for CATV system. 4,527,194, Cl. 358-86.000.
Sisson, Steve S.; Tremoulet, Olivier L., Jr.; and Mercer, John E., to FloWind R & D Partnership. Method and apparatus for attaching blades to rotating structures. 4,525,911, Cl. 29-156.80R.
Sisti, Giorgio; Trestiano, Sorin; and Riva, Ermete, to Carlo Erba Strumentazione S.p.A. Apparatus for chromatographic sample injection. 4,526,686, Cl. 210-198.200.
Sjolin, Conny: *See*—
Lanner, Helmut F., 4,526,218, Cl. 160-374.100.
SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; Walter, Lothar; and Kiener, Heinz, 4,526,259, Cl. 192-91.00A.
Frase, Dietmar; Eisenkolb, Roland; Kiener, Heinz; and Harant, Guter, 4,526,485, Cl. 384-486.000.
SKF Steel Engineering AB: *See*—
Eriksson, Sune; and Santen, Sven, 4,526,612, Cl. 75-10.00R.
SKF Steel Hofors AB: *See*—
Sundberg, Staffan; and Jonsson, Gote, 4,526,556, Cl. 464-182.000.
Skinner, Robert A. Package closure. 4,526,283, Cl. 215-256.000.
Skjaeveland, Magne, to Kverneland A/S. Multi-furrow plow assembly with adjustable plowshare mounts. 4,526,237, Cl. 172-647.000.
Skolnik, Arthur M. Toy vehicle. 4,526,390, Cl. 280-87.04R.
Skryantz, John S.: *See*—
Johnson, Bryce V.; Karayannis, Nicholas M.; and Skryantz, John S., 4,526,882, Cl. 502-105.000.
Slocomb Industries, Inc.: *See*—
Cunningham, Philip J.; and Slocomb, Leon F., Jr., 4,525,952, Cl. 49-449.000.
Slocomb, Leon F., Jr.: *See*—
Cunningham, Philip J.; and Slocomb, Leon F., Jr., 4,525,952, Cl. 49-449.000.
Slosser, James D.: *See*—
Fogt, Kenneth E.; Slosser, James D.; Varos, John A.; and Radhakrishnan, Gopinath, 4,526,828, Cl. 428-229.000.
Smeets, Andreas L. M. T.: *See*—
van den Wildenberg, Adrianus M. M.; and Smeets, Andreas L. M. T., 4,526,155, Cl. 123-525.000.
Smirl, Richard L., to Borg-Warner Corporation. Tension-type belt/pulley system for a continuously variable transmission. 4,526,559, Cl. 474-201.000.
Smith, Douglas D., to Signetics Corporation. Signal translator with supply voltage compensation. 4,527,078, Cl. 307-475.000.
Smith, Edward F., III: *See*—
Haque, Reza; Smith, Edward F., III; and Kadija, Igor V., 4,526,806, Cl. 427-41.000.
Smith, Harry D., Jr., to Halliburton Company. Earth formation density measurement from natural gamma ray spectral logs. 4,527,058, Cl. 250-256.000.
Smith International, Inc.: *See*—
Young, David E., 4,526,243, Cl. 175-195.000.
Smith Kline & French Laboratories Limited: *See*—
Adger, Brian M.; and Mastrocola, Antonietta R., 4,526,974, Cl. 546-329.000.
Smith, L. G. Method for moving a grandstand and a hitch for connecting a tractor to an implement to be towed. 4,526,393, Cl. 280-406.00R.
Smith, Norman: *See*—
Magnus, George; Smith, Norman; and Keyes, Bonnie, 4,526,908, Cl. 521-172.000.
Smith, Raymond H. Electromagnetic turbine system. 4,526,007, Cl. 60-698.000.
Smith, Somers H., III: *See*—
McCarty, George W.; and Smith, Somers H., III, 4,527,110, Cl. 320-2.000.
Smither, Miles A., to AMF Incorporated. Hiline interference eliminator. 4,527,261, Cl. 367-76.000.
Smiths Industries Public Limited Company: *See*—
Lester, Graham G.; Brand, Peter J.; and Deane, Graham, 4,526,573, Cl. 604-33.000.
Snowden, Wesley R.; and Walter, Erhard P., to Corvent International Limited. Hanging folder frame support. 4,526,277, Cl. 211-46.000.
Societa Italiana Vetro-SIV-S.p.A.: *See*—
Cestaro, Massimo; and De Lena, Oscar, 4,527,164, Cl. 343-713.000.
S.A. Presure Granday: *See*—
Granday, Georges; and Jeandot, Marcel, 4,526,792, Cl. 426-56.000.
Societe Nationale Elf Aquitaine: *See*—
Fouletier, Mireille; Siebert, Elisabeth; and Le Moigne, Jacques, 4,526,674, Cl. 204-426.000.
Societe Nationale Elf Aquitaine (Production): *See*—
Delourme, Raymond; Detienne, Jean-Louis; Komornicki, Jacques; and Tellier, Jacques, 4,526,696, Cl. 252-61.000.
Societe Nationale Industrielle et Aerospatiale: *See*—
Gaquere, Jean-Pierre, 4,526,067, Cl. 81-55.000.
Society Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See*—
d'Agostino, Guy; Dhainaut, Andre ; and Petiteau, Jacques A. A., 4,526,343, Cl. 251-367.000.
Solid State Chargers Research & Development: *See*—
McCarty, George W.; and Smith, Somers H., III, 4,527,110, Cl. 320-2.000.
Son, Adelina J.; Neal, Vernon S.; and Garvey, Christopher M., to Halliburton Co.; and TXP Operating Co. Shale and salt stabilizing drilling fluid. 4,526,693, Cl. 252-8.50B.
Sony Corporation: *See*—
Igarashi, Kimizo; Takigawa, Katsumi; Muchi, Tsuneo; Matsumoto, Yoshio; Ueno, Kiichi; and Ohkoshi, Akio, 4,526,601, Cl. 65-59.100.
Kamai, Toshimitsu, 4,527,203, Cl. 360-19.100.
Kozakai, Daisuke; Amano, Toshio; and Nagai, Kunio, 4,527,204, Cl. 360-33.100.
Nagumo, Fumio; and Asaida, Takashi, 4,527,191, Cl. 358-30.000.
Okita, Shin; Shimizu, Hideo; Yamazaki, Noriyuki; Sekiguchi, Fumio; Chimura, Toshihiko; and Shinagawa, Osamu, 4,527,208, Cl. 360-85.000.
Onga, Makoto; Sase, Masatoshi; and Yamanaka, Seisuke, 4,527,190, Cl. 358-30.000.
Takamatsu, Ryoji, 4,527,210, Cl. 360-105.000.
Sony/Tektronix Corporation: *See*—
Sato, Keiichi; Takeuchi, Yoko; and Yanagisawa, Midori, 4,527,230, Cl. 364-130.000.
Sorace, Joseph; and Wright, George, to Advanced Tech Tool, Ltd. High-speed indexing feed screw conveyer. 4,526,128, Cl. 118-314.000.
Sorba, Antoine; Attal, Gerard J.; Seignier, Georges B.; and Hamad, Ahmed M., to Ecole Superieure d'Electricite and Enertec. Process and device for system characterization by spectral analysis. 4,527,116, Cl. 324-77.00B.
Sound Attenuators Limited: *See*—
Chaplin, George B. B.; Jones, Andrew; and Jones, Owen, 4,527,282, Cl. 381-71.000.
South Louisiana Contractors Inc.: *See*—
Hebert, Francis A., 4,526,278, Cl. 212-242.000.
Southern Research Institute: *See*—
Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., 4,526,964, Cl. 544-279.000.
Specht, Viktor: *See*—
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,526,582, Cl. 8-107.000.
Spector, George: *See*—
McNeil, Reginald K.; and Spector, George, 4,525,939, Cl. 36-7.600.
Spectra-Physics, Inc.: *See*—
Geyler, Arthur H., Jr.; and Teach, Ted L., 4,526,201, Cl. 137-625.630.
Speed Queen Company: *See*—
Fey, Robert M.; and Altnau, Ronald L., 4,526,020, Cl. 68-3.00R.

Spencer, Kenneth E.; and Schmitt, Dallas L., to Lukens General Industries, Inc. Means for supporting third rail collector gear and the like on inside bearing railway trucks. 4,526,108, Cl. 105-182.00E.

Speranza, George P.; and Grigsby, Robert A., Jr., to Texaco Inc. Ultraviolet light stabilizing sterically hindered polyoxyalkylene amines. 4,526,972, Cl. 546-191.000.

Sperry Corporation: *See*—
Naaktgeboren, Adrianus, 4,525,991, Cl. 56-341.000.
Sheehan, Ronald T.; Rowland-Hill, E. William; and Bohman, Carl E., 4,527,241, Cl. 364-424.000.
Zbinden, Terry B., 4,527,075, Cl. 307-265.000.

Spilker, Harry: *See*—
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, 4,527,066, Cl. 250-507.100.
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, 4,527,067, Cl. 250-507.100.
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, 4,527,068, Cl. 250-507.100.

Spira, Joel S.: *See*—
Capewell, Dennis; Luchaco, David G.; and Spira, Joel S., 4,527,099, Cl. 315-291.000.

Spire Corporation: *See*—
Little, Roger G.; and Shanfield, Stanley R., 4,526,673, Cl. 204-192.00E.

Springer, Gilbert D., to Ferix Corporation. Toner transfer apparatus with slip action. 4,527,169, Cl. 346-74.200.

SRI International: *See*—
Byrne, George C., 4,527,151, Cl. 340-554.000.
Dawson, Marcia I.; Chan, Rebecca L. S.; and Hobbs, Peter D., 4,526,787, Cl. 514-255.000.

Srinivasan, Seshadri: *See*—
Olinger, John L.; and Srinivasan, Seshadri, 4,526,597, Cl. 65-1.000.

Staar S. A.: *See*—
d'Alayer de Costemore d'Arc, Stephane A. M., 4,527,265, Cl. 369-244.000.

Staar S.A.: *See*—
d'Alayer de Costemore d'Arc, Stephane, 4,527,264, Cl. 369-77.100.

Stabilus GmbH: *See*—
Reuschenbach, Hermann; and Sentinger, Egon, 4,526,088, Cl. 92-12.000.

Stahl, Philip; Fuller, Dudley D.; and Rippel, Harry C., to Ferrofluidics Corporation. Ferrofluid thrust and radial bearing assembly. 4,526,484, Cl. 384-133.000.

Staiger, Gerhard, to BASF Aktiengesellschaft. Preparation of α-monoolefin homopolymers and copolymers. 4,526,944, Cl. 526-142.000.

Stammely, Thomas E., to International Business Machines Corporation. Sub-milliamp mechanical relay control. 4,527,216, Cl. 361-156.000.

Standard Manufacturing Co., Inc.: *See*—
Oswald, Norman D.; Dean, Robert R.; and Mankey, Harry S., 4,526,344, Cl. 254-9.00C.

Standard Oil Company, The: *See*—
Burgess, Lester E.; Fox, Karl M.; and McGarry, Phillip E., 4,526,585, Cl. 44-51.000.
Tsou, Dean T.; Burrington, James D.; Maher, Elizabeth A.; and Grasselli, Robert K., 4,526,884, Cl. 502-154.000.

Standard Oil Company (Indiana): *See*—
Fields, Ellis K.; and Winzenburg, Mark L., 4,526,986, Cl. 549-254.000.
Johnson, Bryce V.; Karayannis, Nicholas M.; and Skryantz, John S., 4,526,882, Cl. 502-105.000.
Maas, Edward T., Jr.; and Kalina, Davida W., 4,526,774, Cl. 423-573.00R.
Mahoney, John A.; Pellet, Regis J.; and Helstrom, John J., 4,526,675, Cl. 208-10.000.
Palm, John W.; and Kunkel, Lorenz V., 4,526,590, Cl. 55-27.000.
Pillsbury, Dale G., 4,526,724, Cl. 556-43.000.

Stanley, Chester A.: *See*—
Vukmanic, Ronald W.; Borucki, John S.; and Stanley, Chester A., 4,525,973, Cl. 52-667.000.

Stanton, Austin N. Building element for heat storage and transfer. 4,526,225, Cl. 165-104.11A.

Stanton, George E., to Nujack Oil Pump Corporation. Method for pumping a liquid from a well and apparatus for use. 4,526,048, Cl. 74-53.000.

Stanton, Philip H., to California Institute of Technology. Omnidirectional, circularly polarized, cylindrical microstrip antenna. 4,527,163, Cl. 343-700.0MS.

Starkweather, John H.: *See*—
Hsia, Edward S.; Emani, Raghuram J.; and Starkweather, John H., 4,526,226, Cl. 165-109.00R.

Starnes, Peter E., to Bestobell (U.K.) Limited. Particle size analysis. 4,526,029, Cl. 73-61.00R.

Staubli-Versol S.A.R.L.: *See*—
Mutschler, Ulrich; Caparros, Pierre; Mouterde, Pierre; and Frappe, Pierre, 4,526,210, Cl. 139-59.000.

Stavrov, Leonid P.: *See*—
Ivanov, Andrei B.; Schegolev, Vladimir I.; Rudakov, Viktor A.; Kosarev, Sergei P.; Grigorieva, Elizaveta A.; Podanenko, Alexandr T.; Romanenko, Oleg N.; Stavrov, Leonid P.; Kondratenko, Anatoly B.; Muzhzhavlev, Konstantin D.; Ovcharenko, Vladimir G.; Khristjuk, Grigory P.; Vasiliev, Alexei V.; Garkavy, Anatoly L.; Gachegov, Ivan G., deceased; and Gachegova, Lidia T., administrator, 4,526,761, Cl. 422-224.000.

Steck, George L., to Steck Manufacturing Co., Inc. Torsion spring adjusting tool and method. 4,526,066, Cl. 81-486.000.

Steck Manufacturing Co., Inc.: *See*—
Steck, George L., 4,526,066, Cl. 81-486.000.

Steckhan, Eberhard; and Wienkamp, Rainer, to BASF Aktiengesellschaft. Electrochemical hydrogenation of nicotinamide adenine dinucleotide. 4,526,661, Cl. 204-73.00R.

Steeman, Peter K. R. M.: *See*—
Op De Beeck, Herbert K. M.; Peeters, Joannes M. T.; and Steeman, Peter K. R. M., 4,527,083, Cl. 313-25.000.

Stehning, Werner, to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft. Scrubber operating method for the desulfurization of flue gases. 4,526,764, Cl. 423-242.000.

Steidle, Gerhard: *See*—
Boll, Rudi; Tetzlaff, Arno; and Steidle, Gerhard, 4,526,427, Cl. 312-111.000.

Steidle-Sailer, Manfred; and Andres, Matthias, to Emil Steidle GmbH & Co. Wood beam. 4,525,974, Cl. 52-693.000.

Steigmeier, Edgar F.; and Auderset, Heinrich, to RCA Corporation. Method for determining the phase of phase transformable light scattering material. 4,526,468, Cl. 356-338.000.

Steklenski, David J.: *See*—
Upson, Donald A.; and Steklenski, David J., 4,526,706, Cl. 252-500.000.

Stenberg, Inga E. Bath-tub tray. 4,525,882, Cl. 4-559.000.

Stengel, Bruce W.: *See*—
Mally, Timothy G.; and Stengel, Bruce W., 4,526,505, Cl. 414-750.000.

Stenzel, Gerhard, to Gao Gesellschaft fur Automation und Organisation mbH. Token such as credit or identification card and an apparatus for testing the token or card. 4,527,051, Cl. 235-380.000.

Stepan Company: *See*—
Magnus, George; Smith, Norman; and Keyes, Bonnie, 4,526,908, Cl. 521-172.000.

Stephanoff, Nicholas N., deceased; and Page, Raymond S., III, executor. Jet-type grinding mill. 4,526,324, Cl. 241-5.000.

Stephenson, Stanley, to Premium Plastics, Inc. One piece multi-purpose clamp. 4,526,172, Cl. 128-322.000.

Sterling Drug Inc.: *See*—
Margulies, Herman, 4,526,291, Cl. 221-63.000.

Stern, Richard M.: *See*—
Scherrer, Robert A.; Stern, Richard M.; and Hammar, Walton J., 4,526,896, Cl. 514-252.000.

Stevens, Vernon C., to Ohio State University, The. Antigenic modification of polypeptides. 4,526,716, Cl. 260-112.50R.

Stevenson, Neil A., to Fisons plc. Eye ointment formulation including the disodium salt of 1,3-bis(2-carboxychromon-5-yloxy)propan-2-ol. 4,526,899, Cl. 514-456.000.

Stewart Engineering & Equipment Co., Inc.: *See*—
Dietz, Keith A., 4,526,266, Cl. 198-357.000.

Stewart, Robert D., to Foster Wheeler Energy Corporation. Fluidized bed reactor utilizing in-bed heat exchanger tubes which register with water wall tubes. 4,526,759, Cl. 422-143.000.

Stewart, Roger G., to United States of America, Army. Overshoot predriven semi-asynchronous driver. 4,527,081, Cl. 307-270.000.

Stilwell, George R., Jr.: *See*—
Kekas, Dennis H.; Stilwell, George R., Jr.; Walsh, Robert M.; and Williams, Roger C., 4,527,285, Cl. 455-607.000.

Stoll, Kurt; and Glattli, Hans-Heinrich. Process and apparatus for producing adapter blocks for systems working with fluid under pressure. 4,526,827, Cl. 428-137.000.

Stomp, Hubert. Safety device for the cover of a metallurgical vessel. 4,526,353, Cl. 266-282.000.

Stone, Mark L.: *See*—
Johnson, Timothy W.; and Stone, Mark L., 4,527,219, Cl. 361-323.000.

Stone, Wayne B., Jr., to Wood Manufacturing Co., Inc. Decanter for reducing oxidation and evaporation of coffee. 4,526,797, Cl. 426-520.000.

Storage Technology Partners: *See*—
Hug, Paul; and Tavares, Antonio, 4,526,313, Cl. 228-180.100.

Stout, Gregg W., to Baker Oil Tools, Inc. Releasable coupling for tubing conveyed subterranean well perforating gun. 4,526,233, Cl. 166-377.000.

Strandberg, Charles F., Jr.; and Strandberg, Robert C., to Strandberg Engineering Laboratories, Inc. Moisture monitoring dryer control apparatus. 4,525,937, Cl. 34-48.000.

Strandberg Engineering Laboratories, Inc.: *See*—
Strandberg, Charles F., Jr.; and Strandberg, Robert C., 4,525,937, Cl. 34-48.000.

Strandberg, Robert C.: *See*—
Strandberg, Charles F., Jr.; and Strandberg, Robert C., 4,525,937, Cl. 34-48.000.

Straubel, Max: *See*—
Guntert, Josef; Hafele, Walter; Pfeifle, Helmut; Schwartz, Reinhard; and Straubel, Max, 4,526,150, Cl. 123-447.000.
Hafele, Walter; Pfeifle, Helmut; Schwartz, Reinhard; and Straubel, Max, 4,526,149, Cl. 123-447.000.

Streschnak, Benno: *See*—
Puchta, Rolf; Nussleim, Hans; Boeck, Alexander; and Streschnak, Benno, 4,526,694, Cl. 252-8.800.

Stretch Devices, Inc.: *See*—
Newman, Don, 4,525,909, Cl. 29-121.100.

Strickland, John I., to Canadian Patents and Development Limited-Societe Canadien Ne Des Brevets Et D'Exploitation Limitee. Radiometer. 4,527,162, Cl. 343-351.000.

Strohmaier, Alfred J., to Du Pont de Nemours, E. I., and Company. Method for applying liquid to a yarn. 4,526,808, Cl. 427-57.000.

Strome, Forrest C., Jr.: *See*—
Gupta, Mool C.; Wrobel, Joseph J.; and Strome, Forrest C., Jr., 4,527,173, Cl. 346-135.100.

Struger, Odo J.: *See*—
Galdun, Daniel J.; Struger, Odo J.; Grants, Valdis; and Brown, Ronald A., 4,527,250, Cl. 364-900.000.

Stuhmeier, Gunter; and Holzinger, Karl, to Herbert Kannegiesser GmbH & Co. Method for dewatering items of washed laundry. 4,525,935, Cl. 34-14.000.

Stutzman, Ellis D. Weather seal with wide range of flexure. 4,525,953, Cl. 49-488.000.

Styrna, Zbigniew B., to Mitel Corporation. Loudspeaking telephone. 4,527,014, Cl. 179-81.00B.

Sublette, John D., to GTE Business Communication Systems Inc. Current regulated pulse dialer with memory retention circuit. 4,527,016, Cl. 179-90.00B.

Subramanyam, Vinayakam; and Rajeckas, Algis, to Du Pont de Nemours, E. I., and Company. Cationic cyanato and thiocyanato complexes useful as radiodiagnostic agents. 4,526,776, Cl. 424-1.100.

Suchy, Milos: *See*—
Frater, Georg; Suchy, Milos; Wenger, Jean; and Winternitz, Paul, 4,526,609, Cl. 71-118.000.

Sudbeck, Rainer; Baumgartner, Hans; and Brandstadter, Manfred, to Pierburg GmbH & Co. Rotary spiral wall pump with pivotably connected guide means and associated method. 4,526,521, Cl. 418-55.000.

Sudweeks, Walter B.: *See*—
Lawrence, Larry D.; Sudweeks, Walter B.; and Larsen, Raymond D., 4,526,633, Cl. 149-109.600.

Sueda, Noriyoshi: *See*—
Takahashi, Toshihiro; Sueda, Noriyoshi; Tsuji, Masahiro; Tahara, Yoshiyuki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Nagase, Masao; and Sugai, Toshiji, 4,526,893, Cl. 514-309.000.

Sugai, Makio: *See*—
Ohtsuki, Akira; Konno, Ryozo; Sugai, Makio; Nishimatsu, Masaharu; Kubota, Yuichi; Tanaka, Kazushi; and Shinoura, Osamu, 4,526,837, Cl. 428-425.900.

Sugai, Toshiji: *See*—
Takahashi, Toshihiro; Sueda, Noriyoshi; Tsuji, Masahiro; Tahara, Yoshiyuki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Nagase, Masao; and Sugai, Toshiji, 4,526,893, Cl. 514-309.000.

Sugii, Hiroshi: *See*—
Ito, Kathuhiko; Sugii, Hiroshi; Takata, Yukito; and Kokubu, Kyoichiro, 4,526,765, Cl. 423-306.000.

Sugimoto, Kinji: *See*—
Nakajima, Jun; Araya, Takeshi; Aso, Tadashi; Kawamata, Kiyoshi; and Sugimoto, Kinji, 4,527,045, Cl. 219-130.310.

Sugimura, Kazuo; and Sugimura, Nobuyuki. Pulsation absorption device for high pressure liquid. 4,526,205, Cl. 138-30.000.

Sugimura, Nobuyuki: *See*—
Sugimura, Kazuo; and Sugimura, Nobuyuki, 4,526,205, Cl. 138-30.000.

Sugino, Kenji: *See*—
Yoshizawa, Akinori; Nakane, Yasuo; Hagimori, Kenji; Ohgai, Koya; Arisawa, Norisada; Takahashi, Tadashi; Maekawara, Hideaki; Imaizumi, Hiroyuki; Tsuchida, Hideyuki; Mieno, Eiichirou; and Sugino, Kenji, 4,526,611, Cl. 75-0.50B.

Sugisaki, Toshihiko: *See*—
Yamanari, Shozo; Horiuchi, Tetsuo; Sugisaki, Toshihiko; and Tominaga, Kenji, 4,526,743, Cl. 376-283.000.

Sumitomo Chemical Company, Limited: *See*—
Saji, Ikutaro; Sato, Renzo; Hanma, Noritaka; and Motoike, Yasuo, 4,526,983, Cl. 548-341.000.
Yamatsuta, Kohji; and Nishio, Ken-ichi, 4,526,841, Cl. 428-614.000.

Sumitomo Electric Industries, Limited: *See*—
Iwata, Hitoshi; Hashimoto, Yoshihiro; and Yamada, Katsuhiko, 4,526,627, Cl. 148-12.00B.
Kakii, Toshiaki; Toda, Yuichi; Matsuno, Koichiro; Usui, Yuichi; and Matsumoto, Michito, 4,526,732, Cl. 264-2.700.

Sumitomo Rubber Industries, Ltd.: *See*—
Nakade, Shinichi, 4,526,375, Cl. 273-235.00R.

Sun Chemical Corporation: *See*—
Comerford, John J.; and Lupoli, Peter J., 4,527,048, Cl. 219-269.000.

Sun Coast Plastics, Inc.: *See*—
Dutt, Herbert V.; and Santostasi, Paul A., 4,526,282, Cl. 215-252.000.

Sun Microsystems, Inc.: *See*—
Bechtolsheim, Andreas V., 4,527,232, Cl. 364-200.000.

Sundberg, Staffan; and Jonsson, Gote, to SKF Steel Hofors AB. Device for connecting two shafts. 4,526,556, Cl. 464-182.000.

Sunder, Shyam: *See*—
Peet, Norton P.; and Sunder, Shyam, 4,526,890, Cl. 514-248.000.
Peet, Norton P.; and Sunder, Shyam, 4,526,979, Cl. 548-251.000.

Sundstrand Corporation: *See*—
Glennon, Timothy F., 4,527,226, Cl. 363-41.000.

Sunstar Kabushi Kaisha: *See*—
Hashimoto, Akira, 4,526,779, Cl. 424-62.000.

Surface Science Corp.: *See*—
Herman, Herbert; and Marantz, Daniel R., 4,526,839, Cl. 428-550.000.

Suso, Norimitsu, to Shikishima Boseki Kabushiki Kaisha. Fabric selvage end cut prevention cutter guide. 4,526,211, Cl. 139-430.000.

Sutherland, Robert L., to Federal Paper Board Co., Inc. Lock arrangement for cartons. 4,526,316, Cl. 229-40.000.

Sutt, Robert F., Jr., to Calgon Carbon Corporation. Carbon molecular sieves and a process for their preparation and use. 4,526,887, Cl. 502-420.000.

Suyama, Tadakazu: *See*—
Uemura, Yahiro; Arimura, Hirofumi; Morise, Hiroshi; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,526,782, Cl. 424-85.000.
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,526,969, Cl. 546-164.000.

Suyama, Tomio; and Osawa, Kazuya, to Hoshizaki Electric Co., Ltd. Water spray unit for ice product making machine. 4,526,014, Cl. 62-347.000.

Suzuawa, Osamu: *See*—
Hoshikawa, Jun; Iwashita, Yukihiro; and Suzuawa, Osamu, 4,526,818, Cl. 428-1.000.

Suzuki, Hidetaka: *See*—
Yamaki, Kiyoshi; Suzuki, Hidetaka, Tanaka, Haruto; and Takeuchi, Yasuhisa, 4,527,155, Cl. 340-727.000.

Suzuki, Kenichi; and Yamada, Kazunari, to Kazunari Yamada. Detectable element and sensor. 4,527,153, Cl. 340-572.000.

Suzuki, Ryoichi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Camera having solid state diaphragm device. 4,526,454, Cl. 354-227.100.

Suzuki, Shigeru; and Tsutsumi, Kazumasu, to Nippon Gakki Seizo Kabushiki Kaisha. Apparatus for controlling braking operation of a magnetic tape transport. 4,527,206, Cl. 360-71.000.

Suzuki, Sigeru: *See*—
Hashiura, Masayoshi; Okazaki, Akiyasu; and Suzuki, Sigeru, 4,527,043, Cl. 219-121.0LQ.

Suzuki, Toru; Sano, Eiichi; and Hanamura, Yoshihiko, to Tokyo Kogaku Kikai Kabushiki Kaisha. Eye fundus camera. 4,526,450, Cl. 351-206.000.

Suzuki, Toshiaki; and Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Radiation image read-out method and apparatus. 4,527,060, Cl. 250-327.200.

Suzuki, Yasunobu; Chiba, Seiichi; and Nishimura, Akihiro, to Shinkawa Ltd. Inner lead bonder. 4,526,646, Cl. 156-361.000.

Suzuki, Yoshikuni: *See*—
Takahashi, Toshihiro; Sueda, Noriyoshi; Tsuji, Masahiro; Tahara, Yoshiyuki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Nagase, Masao; and Sugai, Toshiji, 4,526,893, Cl. 514-309.000.

Swain, James C.; and Yates, Jan B., to Diesel Kiki Co., Ltd. Variable capacity wobble plate compressor capable of controlling angularity of wobble plate with high responsiveness. 4,526,516, Cl. 417-222.000.

Swain, James C., to Borg-Warner Corporation. Power transmission chain and link therefor. 4,526,560, Cl. 474-242.000.

Sweeney, Richard F.: *See*—
Lewis, James M.; Owens, Robert A.; Sweeney, Richard F.; Wake, Ronald W.; and Rinehart, Robert E., 4,526,856, Cl. 430-191.000.

Sweeney, William A., to Chevron Research Company. Purification of olefins by boron trifluoride-alcohol treatment. 4,527,004, Cl. 585-851.000.

Sweeton, David C., to Allen-Bradley Company. Communications network with stations that detect and automatically bypass faults. 4,527,270, Cl. 371-11.000.

Swensen, Michael W., to Texas Instruments Incorporated. Data display keyboard with angular positioning. 4,527,149, Cl. 340-365.00R.

Swessel, John A., Jr.: *See*—
Link, Donald A.; Swessel, John A., Jr.; and Theisen, Peter J., 4,527,027, Cl. 200-144.00R.

Swingley, Harold E., Jr., to Menasha Corporation. Precision tote box insert for holding and locating printed circuit boards or the like. 4,527,222, Cl. 361-415.000.

Swint, Ronnie K., to Kansa Corporation. Insert mechanism for flexible multiple sheet tabloid and advertising publications. 4,526,356, Cl. 270-55.000.

SWS Silicones Corporation: *See*—
Bennington, Lester D.; and McAfee, Richard C., 4,526,955, Cl. 528-33.000.

T.A.D. Avanti, Inc.: *See*—
Martinez, Arthur T., 4,527,209, Cl. 360-96.500.

Tachikawa Blind Kogyo Kabushiki Kaisha: *See*—
Tachikawa, Takeyoshi, 4,525,907, Cl. 29-24.500.

Tachikawa, Takeyoshi, to Tachikawa Blind Kogyo Kabushiki Kaisha. Device for assembling blinds. 4,525,907, Cl. 29-24.500.

Tadokoro, Hiroyuki: *See*—
Yamauchi, Koji; Ito, Shoichi; and Tadokoro, Hiroyuki, 4,527,093, Cl. 315-307.000.

Tahara, Yoshiyuki: *See*—
Takahashi, Toshihiro; Sueda, Noriyoshi; Tsuji, Masahiro; Tahara, Yoshiyuki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Nagase, Masao; and Sugai, Toshiji, 4,526,893, Cl. 514-309.000.

Taiyo Sanso Co., Ltd.: *See*—
Shinohara, Hiroshi; and Nagai, Kiyoshi, 4,527,042, Cl. 219-121.0LC.

Takada, Kazuya; Toyama, Shigeyuki; and Numata, Yoshihiko, to Tokuyama Suda Kabushiki Kaisha. Basic aluminum sulfate and process for production thereof. 4,526,772, Cl. 423-556.000.

Takada, Shun; Onodera, Kaoru; and Kadowaki, Takashi, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material. 4,526,864, Cl. 430-551.000.

Takada, Shunji: *See*—
Mihayashi, Keiji; Takada, Shunji; and Kobayashi, Hidetoshi, 4,526,863, Cl. 430-505.000.

Takahashi, Akio; Shimazaki, Takeshi; Wajima, Motoyo; and Morishita, Hirosada, to Hitachi, Ltd. Multi-layer printed circuit board and process for production thereof. 4,526,835, Cl. 428-413.000.
Takahashi, Kenji; Nagahara, Shusaku; Ozawa, Naoki; Kudo, Koji; and Hirano, Chikafusa, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha Corp. Solid state imaging device. 4,527,200, Cl. 358-213.000.
Takahashi, Tadashi: *See*—
Yoshizawa, Akinori; Nakane, Yasuo; Hagimori, Kenji; Ohgai, Koya; Arisawa, Norisada; Takahashi, Tadashi; Maekawara, Hideaki; Imaizumi, Hiroyuki; Tsuchida, Hideyuki; Mieno, Eiichirou; and Sugino, Kenji, 4,526,611, Cl. 75-0.50B.
Takahashi, Takashi: *See*—
Kanai, Hideyuki; Furukawa, Osamu; Imai, Motomasa; and Takahashi, Takashi, 4,527,146, Cl. 338-20.000.
Takahashi, Toshihiro; Sueda, Noriyoshi; Tsuji, Masahiro; Tahara, Yoshiyuki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Nagase, Masao; and Sugai, Toshiji, to Nisshin Flour Milling Co., Ltd. Isocarbostyril derivatives. 4,526,893, Cl. 514-309.000.
Takahashi, Toshinori: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahashi, Toshinori; and Kiuchi, Tsutomu, 4,527,171, Cl. 346-76.0PH.
Takaishi, Tatsuo: *See*—
Tateishi, Mataji; Kunimoto, Etsuo; and Takaishi, Tatsuo, 4,526,151, Cl. 123-468.000.
Takamatsu, Ryoji, to Sony Corporation. Mode selecting mechanism for magnetic tape recording and/or reproducing apparatus. 4,527,210, Cl. 360-105.000.
Takamatsu, Satoru: *See*—
Chibata, Ichiro; Tosa, Tetsuya; and Takamatsu, Satoru, 4,526,867, Cl. 435-178.000.
Takamura, Koji; Ishii, Fumiaki; Nakajima, Yukio; Yabe, Hisao; Sasa, Hiroyuki; and Nakamura, Takeaki, to Olympus Optical Co., Ltd. Method of cleaning endoscope channels. 4,526,622, Cl. 134-21.000.
Takamura, Koji: *See*—
Ishii, Fumiaki; Sasa, Hiroyuki; Yabe, Hisao; Nakajima, Yukio; Takamura, Koji; and Nakamura, Takeaki, 4,526,623, Cl. 134-21.000.
Takamura, Yoshiyuki: *See*—
Chino, Koichi; Kudo, Kazuhiko; Oda, Akira; Mura, Hideichi; and Takamura, Yoshiyuki, 4,526,713, Cl. 252-632.000.
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahashi, Toshinori; and Kiuchi, Tsutomu, to Victor Company of Japan, Limited. Thermal transfer printing employing a binder. 4,527,171, Cl. 346-76.0PH.
Takase, Sadao; Oshiage, Katsunori; Yamamoto, Akito; and Hosaka, Akio, to Nissan Motor Company, Limited. Engine speed sensing device. 4,527,248, Cl. 364-565.000.
Takashima, Toshiyuki: *See*—
Kondo, Kiyoshi; Takashima, Toshiyuki; and Tunemoto, Daiei, 4,526,987, Cl. 549-305.000.
Takashimaya Nippaisu Kogyo Co., Ltd.: *See*—
Kawamura, Reiki; Tanaka, Takuo; Asano, Toshio; and Sawada, Yasuhiro, 4,526,420, Cl. 297-218.000.
Takata, Minoru: *See*—
Matsuo, Kenji; and Takata, Minoru, 4,527,076, Cl. 307-362.000.
Takata, Yukito: *See*—
Ito, Kathuhiko; Sugii, Hiroshi; Takata, Yukito; and Kokubu, Kyoichiro, 4,526,765, Cl. 423-306.000.
Takaya, Katsuhiko: *See*—
Sakurai, Hisaya; Ikegami, Tadashi; Miya, Masayoshi; and Takaya, Katsuhiko, 4,526,941, Cl. 526-127.000.
Takayasu, Makoto: *See*—
Friedlaender, Fritz J.; Takayasu, Makoto; Hwang, Jiann-Yang; and Petrakis, Leon, 4,526,681, Cl. 209-214.000.
Takazawa, Yosuke: *See*—
Mukai, Yasuo; and Takazawa, Yosuke, 4,526,836, Cl. 428-421.000.
Takeda Chemical Industries, Ltd.: *See*—
Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, 4,526,719, Cl. 260-346.00R.
Takeda, Nobumi, to Shimano Industrial Company Limited. Pedal for a bicycle. 4,526,059, Cl. 74-594.400.
Takeda, Seiichiro: *See*—
Kubota, Kanya; Yamana, Hajimu; and Takeda, Seiichiro, 4,526,658, Cl. 203-13.000.
Takeda, Shuji, to Tanac Engineering Kabushiki Kaisha. Magnetic tensioning device. 4,526,329, Cl. 242-155.00M.
Takeda, Tsunesi: *See*—
Kuroda, Muthmi; Murata, Moriyasu; Takeda, Tsunesi; and Tamura, Junich, 4,526,698, Cl. 252-99.000.
Takegami, Yoshinobu; and Inui, Tomoyuki. Method for supporting metal and/or metal oxide on a crystalline aluminosilicate zeolite catalyst. 4,526,878, Cl. 502-65.000.
Takeshita, Masajiro: *See*—
Hiraoka, Takeshi; Urano, Shigeru; Takeshita, Masajiro; and Nakamura, Keiji, 4,526,617, Cl. 75-236.000.
Takeuchi, Hiroo, to Nissin Kogyo Kabushiki Kaisha. Vacuum booster device. 4,526,089, Cl. 92-98.00D.
Takeuchi, Naoyuki. Deodorized formalin. 4,526,998, Cl. 568-422.000.
Takeuchi, Yasuhisa: *See*—
Yamaki, Kiyoshi; Suzuki, Hidetaka; Tanaka, Haruto; and Takeuchi, Yasuhisa, 4,527,155, Cl. 340-727.000.
Takeuchi, Yoko: *See*—
Sato, Keiichi; Takeuchi, Yoko; and Yanagisawa, Midori, 4,527,230, Cl. 364-130.000.
Takeyasu, Yoshiyuki, to NEC Corporation. Klystron tuning control system. 4,527,129, Cl. 330-45.000.
Takigawa, Katsumi: *See*—
Igarashi, Kimizo; Takigawa, Katsumi; Muchi, Tsuneo; Matsumoto, Yoshio; Ueno, Kiichi; and Ohkoshi, Akio, 4,526,601, Cl. 65-59.100.
Tamai, Mamoru: *See*—
Kamisaka, Makoto; Okamoto, Toshiro; Ohshima, Michio; and Tamai, Mamoru, 4,527,002, Cl. 585-648.000.
Tamura, Junich: *See*—
Kuroda, Muthmi; Murata, Moriyasu; Takeda, Tsunesi; and Tamura, Junich, 4,526,698, Cl. 252-99.000.
Tanabe Seiyaku Co., Ltd.: *See*—
Chibata, Ichiro; Tosa, Tetsuya; and Takamatsu, Satoru, 4,526,867, Cl. 435-178.000.
Tanac Engineering Kabushiki Kaisha: *See*—
Takeda, Shuji, 4,526,329, Cl. 242-155.00M.
Tanaka, Haruto: *See*—
Yamaki, Kiyoshi; Suzuki, Hidetaka; Tanaka, Haruto; and Takeuchi, Yasuhisa, 4,527,155, Cl. 340-727.000.
Tanaka, Hideshi: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahashi, Toshinori; and Kiuchi, Tsutomu, 4,527,171, Cl. 346-76.0PH.
Tanaka, Kazushi: *See*—
Ohtsuki, Akira; Konno, Ryozo; Sugai, Makio; Nishimatsu, Masaharu; Kubota, Yuichi; Tanaka, Kazushi; and Shinoura, Osamu, 4,526,837, Cl. 428-425.900.
Tanaka, Kazuyuki, to Matsushita Electric Industrial Co. Ltd. Display system. 4,527,154, Cl. 340-221.000.
Tanaka, Masanori, to Hosiden Electronics Co., Ltd. Connector with a locking mechanism. 4,526,433, Cl. 339-75.0MP.
Tanaka, Masanori: *See*—
Usui, Koichi; Sato, Teiji; and Tanaka, Masanori, 4,527,178, Cl. 346-207.000.
Tanaka, Takuo: *See*—
Kawamura, Reiki; Tanaka, Takuo; Asano, Toshio; and Sawada, Yasuhiro, 4,526,420, Cl. 297-218.000.
Tanaka, Yoshikazu; Hirano, Hiroyuki; Abo, Keiju; Kumura, Haruyoshi; Yamamuro, Sigeaki; and Morimoto, Yoshiro, to Nissan Motor Co., Ltd. Method and apparatus for controlling a continuously variable transmission. 4,526,557, Cl. 474-18.000.
Tang, Chaucer C., to Du Pont de Nemours, E. I., and Company. Conjugated dienols. 4,526,993, Cl. 549-445.000.
Tang, D. Duan-Lee: *See*—
Silvestri, Victor; and Tang, D. Duan-Lee, 4,526,631, Cl. 148-175.000.
Tang, Robert H., to PPG Industries, Inc. Tertiaryalkyl peroxycarbonates. 4,526,726, Cl. 260-463.000.
Tanielian, Minas; Blackstone, Scott; and Lajos, Robert, to Gould Inc. Method of depositing fully reacted titanium disilicide thin films. 4,526,665, Cl. 204-192.00C.
Tanner, Bertrand D.: *See*—
Campbell, Gaylon S.; Tanner, Bertrand D.; and Gauthier, Robert V., 4,526,034, Cl. 73-336.500.
Tanner, Howard M. C., to HGM, Inc. Detachable laser optical fiber assembly and method of adjustment. 4,526,170, Cl. 128-303.100.
Tansei, Hikaru: *See*—
Maeda, Muneyoshi; Endo, Kazuyuki; and Tansei, Hikaru, 4,526,217, Cl. 152-527.000.
Tanuma, Jiro: *See*—
Kikuchi, Hiroshi; Tanuma, Jiro; Koshida, Yoshinori; and Itaya, Takashi, 4,526,486, Cl. 400-185.000.
Tateishi, Mataji; Kunimoto, Etsuo; and Takaishi, Tatsuo, to Mitsubishi Jukogyo Kabushiki Kaisha. Fuel injection device. 4,526,151, Cl. 123-468.000.
Taubenmann, Peter: *See*—
Thiele, Heino; Weber, Werner; and Taubenmann, Peter, 4,526,907, Cl. 521-133.000.
Tavares, Antonio: *See*—
Hug, Paul; and Tavares, Antonio, 4,526,313, Cl. 228-180.100.
Taya, Akira; Narita, Kazuo; Akiyama, Jun-etsu; Asada, Masao; and Nira, Hisami, to Tokyo Shibaura Denki Kabushiki Kaisha. Fluorescent lamp. 4,527,087, Cl. 313-487.000.
Taya, Tosiki: *See*—
Kondo, Makoto; Nagasaku, Eiichi; Yamamoto, Yuuji; and Taya, Tosiki, 4,526,524, Cl. 418-255.000.
Taylor, Carol O., Sr., to Texas Instruments Incorporated. Pneumatically controlled split cycle cooler. 4,526,008, Cl. 62-6.000.
Taylor, Sharon E. Bottle cover. 4,526,280, Cl. 215-100.500.
Taylor, Thomas N.; Ellis, John R.; and Hubler, Lawrence C., to Xerox Corporation. Compatible copying of computer form documents. 4,526,309, Cl. 226-33.000.
Taylor, Wilhelm, to Xanar, Inc. Beam directing micromanipulator for laser device. 4,526,447, Cl. 350-636.000.
TDK Electronics Co., Ltd.: *See*—
Ohtsuki, Akira; Konno, Ryozo; Sugai, Makio; Nishimatsu, Masaharu; Kubota, Yuichi; Tanaka, Kazushi; and Shinoura, Osamu, 4,526,837, Cl. 428-425.900.
Teac Corporation: *See*—
Shimizu, Tokuzo, 4,526,330, Cl. 242-199.000.
Teach, Ted L.: *See*—
Geyler, Arthur H., Jr.; and Teach, Ted L., 4,526,201, Cl. 137-625.630.

Technicon Instruments Corporation: *See*—
Burns, Donald A.; Margoshes, Marvin; and Cassaday, Michael M., 4,526,754, Cl. 422-82.000.
Teijin Limited: *See*—
Norota, Susumu; Segawa, Yasuhiko; Kiriyama, Tsutomu; Emi, Shingo; Imoto, Tadasi; and Yamauchi, Tetsuo, 4,526,735, Cl. 264-27.000.
Tektronix, Inc.: *See*—
Morgan, David W.; and Andrews, Roland E., 4,527,117, Cl. 324-121.00R.
Reiney, Michael G., 4,527,272, Cl. 371-25.000.
Telectronics Pty. Ltd.: *See*—
Money, David K., 4,527,133, Cl. 332-11.00D.
Tellier, Jacques: *See*—
Delourme, Raymond; Detienne, Jean-Louis; Komornicki, Jacques; and Tellier, Jacques, 4,526,696, Cl. 252-61.000.
Temperilli, Aldemio: *See*—
Salvati, Patricia; Caravaggi, Anna M.; Temperilli, Aldemio; Bosisio, Germano; Sapini, Osvaldo; and di Salle, Enrico, 4,526,892, Cl. 514-288.000.
Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., to Southern Research Institute. 2,4-Diamino-6-(hydroxymethyl)-pyrido[2,3-d]pyrimidine. 4,526,964, Cl. 544-279.000.
Ten Eyck, Monika O.; Kasprzyk, Martin R.; and Tressler, Richard E., to Kennecott Corporation. Foam semiconductor dopant carriers. 4,526,826, Cl. 428-131.000.
Teraki, Yoshinori: *See*—
Nagashima, Masayoshi; Yamane, Hiroshi; Kikkawa, Shigeru; and Teraki, Yoshinori, 4,527,172, Cl. 346-76.0PH.
Teranishi, Nobukazu: *See*—
Ishihara, Yasuo; Oda, Eiji; and Teranishi, Nobukazu, 4,527,182, Cl. 357-24.000.
Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, to Takeda Chemical Industries, Ltd. Benzoquinone derivatives and production thereof. 4,526,719, Cl. 260-346.00R.
Terry, Peter L.: *See*—
Kaufman, Arthur; and Terry, Peter L., 4,526,843, Cl. 429-26.000.
Testamatic, Incorporated: *See*—
Rogers, David P.; and Geisel, Donald J., 4,527,119, Cl. 324-158.00F.
Testud, Jean-Louis: *See*—
Aucel, Jean-Claude; and Testud, Jean-Louis, 4,527,231, Cl. 364-149.000.
Tetra Pak Developpement S.A.: *See*—
Reil, Wilhelm, 4,526,314, Cl. 229-3.100.
Tetzlaff, Arno: *See*—
Boll, Rudi; Tetzlaff, Arno; and Steidle, Gerhard, 4,526,427, Cl. 312-111.000.
Texaco Development Corporation: *See*—
Seufert, Frederick B., 4,526,676, Cl. 208-58.000.
Texaco, Inc.: *See*—
Lin, Jiang-Jen; and Sanderson, John R., 4,526,992, Cl. 549-430.000.
Litzinger, Ronald L., 4,526,679, Cl. 209-3.000.
Speranza, George P.; and Grigsby, Robert A., Jr., 4,526,972, Cl. 546-191.000.
Texacone Company: *See*—
Wheeler, John H., 4,526,385, Cl. 277-153.000.
Texas Instruments Incorporated: *See*—
Bellay, Jeffrey D., 4,527,234, Cl. 364-200.000.
De Filippis, Pietro; Salvatore, Amedeo; Calenda, Ciro; and Notaro, Giuseppe, 4,527,142, Cl. 337-105.000.
Swensen, Michael W., 4,527,149, Cl. 340-365.00R.
Taylor, Carol O., Sr., 4,526,008, Cl. 62-6.000.
Thayer, Steven R.: *See*—
Hoffman, Joseph H.; and Thayer, Steven R., 4,526,510, Cl. 415-175.000.
Theisen, Peter J.: *See*—
Link, Donald A.; Swessel, John A., Jr.; and Theisen, Peter J., 4,527,027, Cl. 200-144.00R.
Theofanous, Theos E. Auto ignition conversion apparatus and method. 4,526,157, Cl. 123-595.000.
Thermoform A/S: *See*—
Hansen, Helge, 4,525,961, Cl. 52-208.000.
Thibieroz, Jean-Pierre A. M.: *See*—
Andrieu, Andre; Davot, Jean-Pierre P.; and Thibieroz, Jean-Pierre A. M., 4,526,872, Cl. 501-4.000.
Thiele, Heino; Weber, Werner; and Taubenmann, Peter, to BASF Aktiengesellschaft. Process and device for the preparation of a reaction mixture of at least two components for the production of foams. 4,526,907, Cl. 521-133.000.
Thiele, Kurt: *See*—
Molnar, Istvan; Thiele, Kurt; Geissmann, Felix; and Jahn, Ulrich, 4,526,898, Cl. 514-392.000.
Thienel, Bernhard. Safety fuse cartridge. 4,527,143, Cl. 337-242.000.
Thierstein, Hans, to GRAPHA-Holding AG. Method and apparatus for storing partially overlapping sheets of paper or the like. 4,526,362, Cl. 271-186.000.
Thies, Peter W.; and David, Samuel, to Kali-Chemie Ag. 2,6-Dioxabicyclo-[2,2,2]-octane-7-yl-acetaldehydes. 4,526,991, Cl. 549-363.000.
Thillen, Guy: *See*—
Legille, Edouard; Bernard, Gilbert; Cimenti, Giovanni; and Thillen, Guy, 4,526,536, Cl. 432-238.000.
Thiokol Corporation: *See*—
Inman, Frank S., 4,525,999, Cl. 60-407.000.
Thomas, Calvin J.; and Day, William J., to Raytheon Company. Microprocessor controlled electric range. 4,527,049, Cl. 219-449.000.
Thomas, Gareth J.: *See*—
Broadhurst, Michael J.; Hassall, Cedric H.; and Thomas, Gareth J., 4,526,960, Cl. 536-6.400.
Thomas, John H., to Kerotest Manufacturing Corp. Pneumatic shut-off valve. 4,526,341, Cl. 251-63.500.
Thomas Swan & Co. Ltd.: *See*—
Richardson, Frank B., 4,526,721, Cl. 260-404.500.
Thompson, Michael D., to Advanced Micro Devices, Inc. Integrated circuit device accepting inputs and providing outputs at the levels of different logic families. 4,527,079, Cl. 307-475.000.
Thompson, Robert W.: *See*—
Pyatt, Lawrence A.; and Thompson, Robert W., 4,527,122, Cl. 324-226.000.
Thomson CSF: *See*—
Huignard, Jean P., 4,527,132, Cl. 332-7.510.
Thorpe, Beatrice E.: *See*—
Walker, Stephen L.; and Thorpe, Beatrice E., 4,526,847, Cl. 430-18.000.
Tifa Limited: *See*—
Livingston, Arnold M., 4,526,548, Cl. 434-226.000.
Timesavers, Inc.: *See*—
Cothrell, LeRoy E.; and Fair, Raymond G., 4,525,955, Cl. 51-135.00R.
Timex Corporation: *See*—
Kindlmann, Peter J., 4,527,096, Cl. 315-169.300.
Tipper Tie, Inc.: *See*—
Gallion, James A.; and Tomczak, Roman M., 4,525,898, Cl. 24-30.50W.
Tochtermann, Henry, to Video Design Pty. Ltd. Airjet label applicator. 4,526,648, Cl. 156-497.000.
Toda, Akitoshi: *See*—
Okada, Takao; Toda, Akitoshi; and Mimura, Yoshiyuki, 4,526,848, Cl. 430-55.000.
Toda, Yuichi: *See*—
Kakii, Toshiaki; Toda, Yuichi; Matsuno, Koichiro; Usui, Yuichi; and Matsumoto, Michito, 4,526,732, Cl. 264-2.700.
Todo, Akira: *See*—
Sakashita, Takeshi; Inagaki, Hajime; Todo, Akira; and Nakano, Takayuki, 4,526,920, Cl. 524-850.000.
Tognoli, Piero: *See*—
Migliacci, Antonio; Bono, Giancarlo; and Tognoli, Piero, 4,526,739, Cl. 264-228.000.
Toho Zinc Co., Ltd.: *See*—
Yoshizawa, Akinori; Nakane, Yasuo; Hagimori, Kenji; Ohgai, Koya; Arisawa, Norisada; Takahashi, Tadashi; Maekawara, Hideaki; Imaizumi, Hiroyuki; Tsuchida, Hideyuki; Mieno, Eiichirou; and Sugino, Kenji, 4,526,611, Cl. 75-0.50B.
Tokuyama Suda Kabushiki Kaisha: *See*—
Takada, Kazuya; Toyama, Shigeyuki; and Numata, Yoshihiko, 4,526,772, Cl. 423-556.000.
Tokyo Keiki Company Limited: *See*—
Ito, Koji; Onishi, Masanori; and Hayashi, Hisao, 4,527,283, Cl. 382-9.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Suzuki, Toru; Sano, Eiichi; and Hanamura, Yoshihiko, 4,526,450, Cl. 351-206.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ariizumi, Shoji, 4,527,213, Cl. 361-56.000.
Kanai, Hideyuki; Furukawa, Osamu; Imai, Motomasa; and Takahashi, Takashi, 4,527,146, Cl. 338-20.000.
Kosaka, Takashi; Koga, Takamasa; and Konishi, Kuniyoshi, 4,527,277, Cl. 375-82.000.
Kurosawa, Ryoichi, 4,527,120, Cl. 324-166.000.
Matsuo, Kenji; and Takata, Minoru, 4,527,076, Cl. 307-362.000.
Nagashima, Masayoshi; Yamane, Hiroshi; Kikkawa, Shigeru; and Teraki, Yoshinori, 4,527,172, Cl. 346-76.0PH.
Nakagawa, Akira, 4,527,263, Cl. 369-46.000.
Okano, Haruo; Yamazaki, Takashi; Horiike, Yasuhiro; and Horie, Hiromichi, 4,526,643, Cl. 156-345.000.
Onoda, Izumi, 4,526,522, Cl. 418-63.000.
Ooi, Kazushige; Fujiwara, Shigekazu; Yoshida, Nobuaki; and Mori, Yoshio, 4,527,189, Cl. 358-29.000.
Taya, Akira; Narita, Kazuo; Akiyama, Jun-etsu; Asada, Masao; and Nira, Hisami, 4,527,087, Cl. 313-487.000.
Watanabe, Shingo; and Itou, Takeo, 4,526,854, Cl. 430-176.000.
Yoshizawa, Shuji, 4,526,805, Cl. 427-38.000.
Zeidman, Gordon G., 4,526,460, Cl. 355-3.0FU.
Tolley, Derek C. Sun beds. 4,525,884, Cl. 5-423.000.
Tombrello, Thomas A.; Qiu, Yuanxun; and Mendenhall, Marcus H., to California Institute of Technology. Enhanced adhesion of films to semiconductors or metals by high energy bombardment. 4,526,624, Cl. 148-1.500.
Tomczak, Roman M.: *See*—
Gallion, James A.; and Tomczak, Roman M., 4,525,898, Cl. 24-30.50W.
Tomczak, Walter F., to MacGregor Sporting Goods, Inc. Chest protector with rigid plates. 4,525,875, Cl. 2-2.000.
Tominaga, Kenji: *See*—
Yamanari, Shozo; Horiuchi, Tetsuo; Sugisaki, Toshihiko; and Tominaga, Kenji, 4,526,743, Cl. 376-283.000.
Tomita, Seisuke: *See*—
Oshima, Noboru; Shimizu, Isamu; Yoshimura, Yoshito; Fujimaki, Tatsuo; and Tomita, Seisuke, 4,526,934, Cl. 525-332.900.
Topps Chewing Gum, Incorporated: *See*—
Samala, Fred, 4,526,790, Cl. 426-5.000.

Toray Industries, Inc.: *See*—
Miyoshi, Takehiko; Matsumoto, Tadayuki; and Sano, Keizo, 4,526,738, Cl. 264-176.00F.
Toro Company, The: *See*—
Scott, Loren W., 4,526,198, Cl. 137-624.200.
Tosa, Tetsuya: *See*—
Chibata, Ichiro; Tosa, Tetsuya; and Takamatsu, Satoru, 4,526,867, Cl. 435-178.000.
Tosaki, Satoshi: *See*—
Ohi, Nobukazu; Ohno, Koji; and Tosaki, Satoshi, 4,526,619, Cl. 106-35.000.
Toso Kabushiki Kaisha: *See*—
Fukada, Hiroo, 4,525,893, Cl. 16-102.000.
Toth, James E.: *See*—
Elsenbaumer, Ronald L.; Miller, Granville G.; and Toth, James E., 4,526,708, Cl. 252-518.000.
Toth, Laszlo . Local heating insallation. 4,526,319, Cl. 237-50.000.
Toti, Andrew J. Apparatus for forming elongated sheet metal panels. 4,526,024, Cl. 72-177.000.
Toudo, Kenzi: *See*—
Miyanaka, Motoshi; Toudo, Kenzi; and Sagawa, Toshiaki, 4,527,125, Cl. 328-6.000.
Tovenrath, Claus; and Windischbauer, Florian, to Lindauer Dornier Gesellschaft mbH. Device for drawing warp threads into readied heddles and drop wires. 4,525,906, Cl. 28-205.000.
Towmotor Corporation: *See*—
Johannson, Richard J., 4,526,251, Cl. 187-9.00R.
Townsend, Douglas W.: *See*—
Boxall, Larry G.; Buchta, William M.; Cooke, Arthur V.; Nagle, Dennis C.; and Townsend, Douglas W., 4,526,911, Cl. 523-445.000.
Toyama, Shigeyuki: *See*—
Takada, Kazuya; Toyama, Shigeyuki; and Numata, Yoshihiko, 4,526,772, Cl. 423-556.000.
Toyo Ink MFG. Co., Ltd.: *See*—
Ohtsuki, Akira; Konno, Ryozo; Sugai, Makio; Nishimatsu, Masaharu; Kubota, Yuichi; Tanaka, Kazushi; and Shinoura, Osamu, 4,526,837, Cl. 428-425.900.
Toyo Seikan Kaisha Ltd.: *See*—
Miyamatsu, Yasunori; Kaga, Yasuo; Aizawa, Masanori; Ishibashi, Kazuhisa; and Ueno, Hiroshi, 4,526,287, Cl. 220-260.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kawamura, Reiki; Tanaka, Takuo; Asano, Toshio; and Sawada, Yasuhiro, 4,526,420, Cl. 297-218.000.
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,526,610, Cl. 75-0.5BC.
TP Industrial, Inc.: *See*—
Hackett, Walter J.; and Galena, Peter E., 4,526,815, Cl. 427-355.000.
Traitler, Helmut: *See*—
Ingenbleek, Yves; Traitler, Helmut; and Wessely, Jean-Yves, 4,526,793, Cl. 426-72.000.
Transmation, Inc.: *See*—
Muller-Girard, Otto; and Schulp, Philip P., 4,527,217, Cl. 361-179.000.
Trapp, Turner J.: *See*—
Cawley, William E.; and Trapp, Turner J., 4,526,741, Cl. 376-185.000.
Treadwell, Stephen S.: *See*—
Martell, Charles R.; Leslie, Elmer N.; and Treadwell, Stephen S., 4,526,114, Cl. 112-262.100.
Tremoulet, Olivier L., Jr.: *See*—
Sisson, Steve S.; Tremoulet, Olivier L., Jr.; and Mercer, John E., 4,525,911, Cl. 29-156.80R.
Tressler, Richard E.: *See*—
Ten Eyck, Monika O.; Kasprzyk, Martin R.; and Tressler, Richard E., 4,526,826, Cl. 428-131.000.
Trestiano, Sorin: *See*—
Sisti, Giorgio; Trestiano, Sorin; and Riva, Ermete, 4,526,686, Cl. 210-198.200.
Tri County Tool Inc.: *See*—
Bernstein, Victor H., 4,525,908, Cl. 29-76.00C.
Tripier, Dominique: *See*—
Seipke, Gerhard; and Tripier, Dominique, 4,526,717, Cl. 260-112.50R.
Trotter, Donald M., Jr., to Corning Glass Works. Metal patterns on photosensitive glasses. 4,526,785, Cl. 428-209.000.
Trubisky, Leonard G.: *See*—
Ryan, Charles P.; Guenthner, Russell W.; and Trubisky, Leonard G., 4,527,238, Cl. 364-200.000.
TRW Inc.: *See*—
Boughton, Edward M.; and Jones, Lewis O., 4,526,851, Cl. 430-106.600.
Tsai, John W.: *See*—
Evans, Robert H.; Espersen, Charles H.; and Tsai, John W., 4,526,364, Cl. 271-272.000.
Tsou, Dean T.; Burrington, James D.; Maher, Elizabeth A.; and Grasselli, Robert K., to Standard Oil Company, The. Ruthentum containing catalyst composition useful for process for the demerization of acrylic compounds. 4,526,884, Cl. 502-154.000.
Tsuchida, Hideyuki: *See*—
Yoshizawa, Akinori; Nakane, Yasuo; Hagimori, Kenji; Ohgai, Koya; Arisawa, Norisada; Takahashi, Tadashi; Maekawara, Hideaki; Imaizumi, Hiroyuki; Tsuchida, Hideyuki; Mieno, Eiichirou; and Sugino, Kenji, 4,526,611, Cl. 75-0.50B.
Tsuda, Yoshio: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,526,969, Cl. 546-164.000.
Tsuji, Hiroshi; and Katada, Hirofumi, to POLA Chemical Industries, Inc. Portable cosmetics case. 4,526,273, Cl. 206-229.000.
Tsuji, Masahiro: *See*—
Takahashi, Toshihiro; Sueda, Noriyoshi; Tsuji, Masahiro; Tahara, Yoshiyuki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Nagase, Masao; and Sugai, Toshiji, 4,526,893, Cl. 514-309.000.
Tsumiyama, Hisanori: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahashi, Toshinori; and Kiuchi, Tsutomu, 4,527,171, Cl. 346-76.0PH.
Tsumuraya, Kenichi; and Furuya, Toshiaki, to Seikosha Co., Ltd. Printer housing with web tensioning means. 4,526,489, Cl. 400-693.000.
Tsunekawa, Tokuichi: *See*—
Kinoshita, Takao; Tsunekawa, Tokuichi; and Sato, Yuichi, 4,527,199, Cl. 358-213.000.
Tsutsumi, Kazumasu: *See*—
Suzuki, Shigeru; and Tsutsumi, Kazumasu, 4,527,206, Cl. 360-71.000.
Tucker, Kenneth W.: *See*—
Joo , Louis A.; Tucker, Kenneth W.; and Webb, Scott D., 4,526,669, Cl. 204-243.00R.
Tunemoto, Daiei: *See*—
Kondo, Kiyoshi; Takashima, Toshiyuki; and Tunemoto, Daiei, 4,526,987, Cl. 549-305.000.
Tunks, M. Larry. Crank and braking mechanism for fishing reels. 4,526,331, Cl. 242-218.000.
Turbine Components Corporation: *See*—
Shankar, Srinivasan; and Goward, G. William, 4,526,814, Cl. 427-253.000.
Turunen, Olli: *See*—
Selin, Johan; Huttunen, Jouko; Turunen, Olli; Eklund, Vidar; and Ekman, Kurt, 4,526,620, Cl. 106-203.000.
TXP Operating Co.: *See*—
Son, Adelina J.; Neal, Vernon S.; and Garvey, Christopher M., 4,526,693, Cl. 252-8.50B.
Uchiyama, Takashi: *See*—
Suzuki, Ryoichi; and Uchiyama, Takashi, 4,526,454, Cl. 354-227.100.
Uegaki, Tatsufumi: *See*—
Matsuyama, Junya; Kamada, Akio; Kawabata, Fumimaru; Uegaki, Tatsufumi; and Miyake, Shigeru, 4,527,033, Cl. 219-61.000.
Uemura, Kazuho: *See*—
Sato, Yasuo; Fukushima, Akio; Kaise, Toshiro; Honda, Yoshiyuki; Uemura, Kazuho; and Fujii, Manabu, 4,526,010, Cl. 62-126.000.
Uemura, Yahiro; Arimura, Hirofumi; Morise, Hiroshi; Funakoshi, Satoshi; and Suyama, Tadakazu, to Green Cross Corporation, The. Process for recovering interferon. 4,526,782, Cl. 424-85.000.
Ueno, Hiroshi: *See*—
Miyamatsu, Yasunori; Kaga, Yasuo; Aizawa, Masanori; Ishibashi, Kazuhisa; and Ueno, Hiroshi, 4,526,287, Cl. 220-260.000.
Ueno, Kiichi: *See*—
Igarashi, Kimizo; Takigawa, Katsumi; Muchi, Tsuneo; Matsumoto, Yoshio; Ueno, Kiichi; and Ohkoshi, Akio, 4,526,601, Cl. 65-59.100.
Ulrich, Lawrence W.; and Walker, Connie W., to Durable Packaging Corporation. Apparatus for sealing cartons. 4,525,980, Cl. 53-374.000.
Umemura, Toshikazu: *See*—
Sakurai, Masanori; Miyawaki, Junichi; Umemura, Toshikazu; and Shibata, Akiyoshi, 4,526,921, Cl. 524-405.000.
Undin, Hans; and Wiener, Hans, to C. A. Weidmuller GmbH & Co. Tool for removing insulation. 4,526,068, Cl. 81-9.400.
Undin, Hans: *See*—
Wiener, Hans; and Undin, Hans, 4,526,070, Cl. 81-361.000.
Union Carbide Corporation: *See*—
Acharya, Arun; and BeVier, William E., 4,526,877, Cl. 502-60.000.
Faulring, Gloria M., 4,526,613, Cl. 75-12.000.
Gioffre, Anthony J., 4,526,583, Cl. 8-137.000.
Kaiser, Steven W., 4,527,001, Cl. 585-643.000.
Keogh, Michael J., 4,526,930, Cl. 525-105.000.
Keshavan, Madapusi K.; and Weatherly, Merle H., 4,526,618, Cl. 106-1.050.
Kilgour, John A.; and Petty, Herbert E., 4,526,996, Cl. 556-413.000.
Mercuri, Robert A.; and Criscione, John M., 4,526,834, Cl. 428-408.000.
Pickwell, Robert J.; and Osterholtz, Frederick D., 4,526,922, Cl. 524-445.000.
Raudys, Vytas A., 4,525,895, Cl. 17-1.00R.
Wheeler, Thomas N.; and Weiden, Mathias H. J., 4,526,723, Cl. 260-410.500.
Williams, Thomas C., 4,526,954, Cl. 528-15.000.
Union Special Corporation: *See*—
Kosrow, Robert L.; and Yin, Chieh-Kung, 4,526,115, Cl. 112-262.300.
Union Special G.m.b.H.: *See*—
von Hagen, Wolf R., 4,526,119, Cl. 112-322.000.
United Kingdom Atomic Energy Authority: *See*—
Carter, John H., 4,526,626, Cl. 148-6.14R.
United States of America
Agriculture: *See*—
Carlson, David A.; and McLaughlin, John R., 4,527,000, Cl. 585-16.000.

Schwab, Arthur W.; and Pryde, Everett H., 4,526,586, Cl. 44-53.000.
Army: *See—*
Binder, Michael; Walker, Charles W., Jr.; Petersen, Eric R.; Wade, William L., Jr.; and Gilman, Sol, 4,526,881, Cl. 502-101.000.
Gutleber, Frank S., 4,527,276, Cl. 375-23.000.
Hartley, Joseph H., 4,527,137, Cl. 333-137.000.
Kronenberg, Stanley; and Lux, Robert A., 4,527,063, Cl. 250-370.000.
Stewart, Roger G., 4,527,081, Cl. 307-270.000.
Energy: *See—*
Anderson, David F., 4,527,064, Cl. 250-374.000.
Boland, James F.; and Koenig, John F., 4,526,136, Cl. 122-451.100.
Cawley, William E.; and Trapp, Turner J., 4,526,741, Cl. 376-185.000.
Feldman, Barry J., 4,526,664, Cl. 204-157.10R.
Iacovangelo, Charles D.; and Browall, Kenneth W., 4,526,812, Cl. 427-115.000.
McKelvey, Thomas E.; and Guarnieri, Joseph J., 4,527,005, Cl. 136-221.000.
Peterson, William J., 4,526,272, Cl. 198-819.000.
Radke, Clayton J., 4,526,231, Cl. 166-270.000.
Environmental Protection Agency: *See—*
Lin, Philip C.; and Ho, James S., 4,525,979, Cl. 53-268.000.
National Aeronautics and Space Administration: *See—*
Ebihara, Ben T., 4,527,092, Cl. 315-5.380.
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-Ta S.; and Chen, Timothy S., 4,526,925, Cl. 524-548.000.
Navy: *See—*
Bernett, Marianne K.; Weber, David C.; and Ravner, Harold, 4,526,832, Cl. 428-336.000.
Brauer, Larry F.; and Leach, Roger W., 4,526,104, Cl. 102-228.000.
Chang, Marguarite S.; and Orndoff, Robert R., 4,526,980, Cl. 548-258.000.
Lukens, James E.; and Mankiewich, Paul M., 4,526,858, Cl. 430-296.000.
Mohon, Windell N.; and Burns, Jimmy H., 4,526,545, Cl. 434-38.000.
Moon, Deug W.; and Metzbower, Edward A., 4,527,040, Cl. 219-121.0LD.
Novinson, Thomas, 4,527,062, Cl. 250-351.000.
Sears, Billy D.; Holland, Gerald G.; Cazinha, John R.; and Reames, Donovan J., 4,525,956, Cl. 51-241.00S.
Wehner, Donald R., 4,527,161, Cl. 343-16.00M.
Transportation: *See—*
Ceccon, Harry; Murphy, Richard A.; Reed, H. David; and Orringer, Oscar, 4,526,039, Cl. 73-774.000.
U.S. Philips Corporation: *See—*
Deconche, Alain; and Van Uffelen, Jean-Pierre H., 4,527,278, Cl. 375-97.000.
de Ronde, Frans C., 4,527,165, Cl. 343-778.000.
Hovens, Paulus J. M., 4,527,196, Cl. 358-158.000.
Kopinga, Wiert; and Mimmel, Herbert, 4,527,017, Cl. 179-115.5PV.
Krull, Joachim, 4,526,488, Cl. 400-202.400.
Lutteke, Georg, 4,527,130, Cl. 331-36.00C.
Op De Beeck, Herbert K. M.; Peeters, Joannes M. T.; and Steeman, Peter K. R. M., 4,527,083, Cl. 313-25.000.
Post, Sieghard, 4,527,141, Cl. 336-192.000.
van der Heijden, Rudolf L. A.; and Dorleijn, Jan W. F., 4,527,097, Cl. 315-246.000.
van der Sluys, Willem L. N.; and Hermans, Mathias L., 4,526,009, Cl. 62-101.000.
van Uijen, Cornelis M. J., 4,527,124, Cl. 324-309.000.
U.S. Precision Lens, Inc.: *See—*
Betensky, Ellis I.; and Welham, Brian H., 4,526,442, Cl. 350-412.000.
United States Steel Corporation: *See—*
Box, William A.; and Rusiecki, Eugene R., 4,526,038, Cl. 73-644.000.
United Technologies Corporation: *See—*
Antonellis, Stephen M.; and Breunig, Roger D., 4,526,508, Cl. 415-172.00A.
Baran, Walter J., Jr., 4,525,997, Cl. 60-39.161.
Levine, Richard, 4,526,511, Cl. 416-95.000.
Reiser, Carl A.; and Maricle, Donald L., 4,526,845, Cl. 429-41.000.
Schwarz, Frederick M., 4,525,998, Cl. 60-226.100.
Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG: *See—*
Kuhnert, Gottfried; and Lutz, Albert, 4,526,018, Cl. 66-78.000.
Universal Well Control Systems: *See—*
Miller, Charles J., 4,526,339, Cl. 251-1.300.
University of California, The Regents of the: *See—*
Henderson, Jerald M.; and Furman, Burford J., 4,526,269, Cl. 198-443.000.
Urist, Marshall R., 4,526,909, Cl. 523-115.000.
University of Delaware: *See—*
Hall, Robert B.; and Rocheleau, Richard E., 4,526,809, Cl. 427-74.000.
University of Minnesota, Regents of the: *See—*
Schwartz, Samuel, 4,526,869, Cl. 436-66.000.
University of Waterloo: *See—*
Young, Murray M., 4,526,791, Cl. 426-53.000.
UOP Inc.: *See—*
Joy, George C., III, 4,526,886, Cl. 502-339.000.
Upjohn Company, The: *See—*
Durvasula, Visweswara R., 4,526,984, Cl. 549-241.000.
Van Rheenen, Verlan H.; and Cha, Dae Y., 4,526,720, Cl. 260-397.400.
Upson, Donald A.; and Steklenski, David J., to Eastman Kodak Company. Conductive latex compositions, elements and processes. 4,526,706, Cl. 252-500.000.
Ura, Hiroaki; and Kato, Shogo, to Konishiroku Photo Industry Co., Ltd. Paper feeding mechanism. 4,526,358, Cl. 271-34.000.
Urano, Shigeru: *See—*
Hiraoka, Takeshi; Urano, Shigeru; Takeshita, Masajiro; and Nakamura, Keiji, 4,526,617, Cl. 75-236.000.
Urbin, Jack: *See—*
Guerout, Jean B.; and Urbin, Jack, 4,525,927, Cl. 29-861.000.
Urdal, Jan, to Schlage Lock Company. Clutch mechanism. 4,526,256, Cl. 192-40.000.
Urist, Marshall R., to University of California, Regents of the. Polymethylmethacrylate delivery system for bone morphogenetic protein. 4,526,909, Cl. 523-115.000.
Usui, Koichi; Sato, Teiji; and Tanaka, Masanori, to Mizusawa Industrial Chemicals, Ltd. Heat-sensitive recording paper and filler therefor. 4,527,178, Cl. 346-207.000.
Usui, Yuichi: *See—*
Kakii, Toshiaki; Toda, Yuichi; Matsuno, Koichiro; Usui, Yuichi; and Matsumoto, Michito, 4,526,732, Cl. 264-2.700.
Valmet Oy: *See—*
Karvinen, Mikko; and Laapotti, Jorma, 4,526,655, Cl. 162-360.100.
Van Brunt, Nicholas P., to Control Data Corporation. Simulator system for logic design validation. 4,527,249, Cl. 364-578.000.
van Degeer, Peter M., to FDO Technische Adviseurs B.V. Divisible cabin for a windmill. 4,527,072, Cl. 290-55.000.
van den Haak, Rob. Anchor rack. 4,526,123, Cl. 114-210.000.
van den Wildenberg, Adrianus M. M.; and Smeets, Andreas L. M. T., to Vialle B.V. Pressure regulating system. 4,526,155, Cl. 123-525.000.
van der Heijden, Rudolf L. A.; and Dorleijn, Jan W. F., to U.S. Philips Corporation. High-pressure sodium discharge lamp. 4,527,097, Cl. 315-246.000.
van der Pol, Ronald; and Mertens, Dieter, to Rheotron AG. Liquid level measuring apparatus. 4,527,107, Cl. 318-642.000.
van der Sluys, Willem L. N.; and Hermans, Mathias L., to U.S. Philips Corporation. Method of operating a bimodal heat pump, as well as bimodal heat pump for using said method. 4,526,009, Cl. 62-101.000.
van der Voort, Gabriel N. M. M.; and Groeneveld, Marinus, to Oce-Nederland B.V. Multilayer electrophotographic amorphous silicon element for electrophotographic copying processes. 4,526,849, Cl. 430-57.000.
Van Rheenen, Verlan H.; and Cha, Dae Y., to Upjohn Company, The. Process to prepare stabilized monolithium acetylide. 4,526,720, Cl. 260-397.400.
Van Thyne, Ray J.: *See—*
Rausch, John J.; and Novy, Russell F., 4,526,817, Cl. 427-431.000.
Van Uffelen, Jean-Pierre H.: *See—*
Deconche, Alain; and Van Uffelen, Jean-Pierre H., 4,527,278, Cl. 375-97.000.
van Uijen, Cornelis M. J., to U.S. Philips Corporation. Method of and device for determining a nuclear magnetization distribution in a part of a body. 4,527,124, Cl. 324-309.000.
van Wijnandsbergen, Marius F. F.: *See—*
Boersma, Rintje; van Wijnandsbergen, Marius F. F.; Irik, Gijsbert W.; and Marien, Pieter, 4,527,220, Cl. 361-332.000.
Varian Associates, Inc.: *See—*
Gerard, William A.; and Foreman, Robert J., 4,527,094, Cl. 315-39.550.
Preist, Donald H., 4,527,091, Cl. 315-5.000.
Varos, John A.: *See—*
Fogt, Kenneth E.; Slosser, James D.; Varos, John A.; and Radhakrishnan, Gopinath, 4,526,828, Cl. 428-229.000.
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Vayas, John; Zembilis, Konstantinos; and Zembilis, Lemonia. Pail cover having mopwringer. 4,525,892, Cl. 15-263.000.
Vazquez, Frank B. Tap changer. 4,527,022, Cl. 200-8.00R.
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Vecera, Guy L., Jr. Multi-functional tire testing tool. 4,526,030, Cl. 73-146.800.
Venditti, Arthur P. Spelling game. 4,526,371, Cl. 273-148.00R.
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Victor Company of Japan, Ltd.: *See—*
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Vincent, Arthur L; Robinson, James R.; and Ginkel, Ernst R., to International Telephone & Telegraph Corporation. Gas analyzer or the like. 4,526,755, Cl. 422-90.000.
Vogt, Michael: *See—*
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,526,582, Cl. 8-107.000.
Vohrer, Christoph. Plastic connector for hoses. 4,526,410, Cl. 285-149.000.
Vongeheur, Hermann-Otto, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG. Apparatus for pouring confectionary solution. 4,526,299, Cl. 222-146.400.
von Hagen, Wolf R., to Union Special G.m.b.H. Sewing machine having a driven feed roller. 4,526,119, Cl. 112-322.000.
von Philipp, Fritz; and Schimanski, Georg, to Globol-Werk GmbH. Apparatus for vaporizing insecticides, perfumes and/or other volatile agents. 4,526,320, Cl. 239-43.000.
von Seggern, Heinz, to AT&T Bell Laboratories. Stable positively charged Teflon electrets. 4,527,218, Cl. 361-233.000.
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Voorheis, James T., to Voorheis Industries, Inc. Flow-reversing nozzle assembly. 4,526,322, Cl. 239-404.000.
Vroome, Ray L. Fireplace grate. 4,526,159, Cl. 126-164.000.
Vukmanic, Ronald W.; Borucki, John S.; and Stanley, Chester A., to Chicago Metallic Corporation. Suspended ceiling system. 4,525,973, Cl. 52-667.000.
W. Haldenwanger Technische Keramik GmbH & Co. KG: *See—*
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Wakefield, Donald C., deceased (by Wakefield, June, executrix), to Kontak Manufacturing Co. Ltd. Actuator device for a hydraulic spool valve. 4,526,342, Cl. 251-131.000.
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Walker, Stephen L.; and Thorpe, Beatrice E., to Weber Marking Systems, Inc. Image receiving transparency and method of making. 4,526,847, Cl. 430-18.000.
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Wang, Patricia C.; and Dawson, Daniel J., to Dynapol. Polymeric active methylene compounds, their preparation and their use in azo polymers. 4,526,933, Cl. 525-326.800.
Wantuch, Ernest, to Premier Microwave Corp. Reciprocal RF switch. 4,527,134, Cl. 333-1.100.
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Ward, Terence J., to John Wyeth & Brother Limited. Benzoquinolizines and use as α_2-adrenoceptor antagonistics. 4,526,967, Cl. 546-95.000.
Warmath, John: *See—*
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Watanabe, Hiroshi; Shimamura, Isao; Abe, Masao; and Mizusawa, Masashi, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Surface treatment of aluminum or aluminum alloys. 4,526,671, Cl. 204-37.600.
Watanabe, Shingo; and Itou, Takeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Photoresist composition with water soluble bisazide and diazo compound. 4,526,854, Cl. 430-176.000.
Watanabe, Shunso F., to Ford Motor Company. Carburetor throttle valve actuator. 4,526,060, Cl. 74-626.000.
Watanabe, Takeshi, to Nippon Electric Co., Ltd. Semiconductor device having insulated gate type non-volatile semiconductor memory elements. 4,527,259, Cl. 365-189.000.
Watanuki, Yoshio: *See—*
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Water & Industrial Waste Laboratories, Inc.: *See—*
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Webb, Scott D.: *See—*
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Weber, Christian A.; and Paige, William P., to Dow Chemical Company, The. Low gloss carbonate polymer blends. 4,526,926, Cl. 525-67.000.
Weber, Dane M.: *See—*
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Wegner, Gunter H., to Wegner Development Company. Non-burning, non-dripping instant set microcellular polyurethanes. 4,526,906, Cl. 521-107.000.
Wehner, Donald R., to United States of America, Navy. 3D Imaging with stepped frequency waveforms and monopulse processing. 4,527,161, Cl. 343-16.00M.
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Weyerhaeuser Company: *See—*
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Wheeler, John H., to Texacone Company. Self-lubricating packing member. 4,526,385, Cl. 277-153.000.

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Whitaker, Gene C., to Whitlog, Inc. Apparatus for converting a trailer having a cantilevered reach into a trailer having a reach extending between spaced-apart sets of wheels. 4,526,394, Cl. 280-404.000.

White, George, to Du Pont Canada Inc. Cross-linkable polyethylene compositions. 4,526,916, Cl. 524-128.000.

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White, Harvey C. Optical fiber sensing device for hydraulic motors. 4,527,054, Cl. 250-227.000.

White, Leonard A., to Baxter Travenol Laboratories, Inc. Transparentizing. 4,526,803, Cl. 427-14.100.

Whitehead, Howard A., to Kimberly-Clark Corporation. Fluid pervious thermoplastic containing web with fused barrier lines positioned in registry on the web. 4,526,825, Cl. 428-74.000.

Whiteman, Patrick W., to Recycled Paper Bedding, Inc. Hammermill apparatus for subdividing cellulosic material. 4,526,325, Cl. 241-73.000.

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Wilhelm Gebhardt GmbH: *See—*
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Wilkinson, William K., to Du Pont de Nemours, E. I., and Company. Water soluble polyamines and process for their preparation. 4,526,935, Cl. 525-345.000.

Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Sewing machine material guiding device. 4,526,117, Cl. 112-308.000.

Williams, Howard G. Remote controlled self-powered excavator apparatus. 4,526,413, Cl. 294-88.000.

Williams International Corporation: *See—*
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Williams, Thomas C., to Union Carbide Corporation. Organosiloxane polymers and compositions containing same curable upon exposure to gaseous oxygen. 4,526,954, Cl. 528-15.000.

Wilson, Dennis: *See—*
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Winkler, David S.; and Diamond, Jeffrey H., to J. H. Diamond Company. Dimer polymeric coating selectively strippable as cohesive film. 4,526,913, Cl. 524-31.000.

Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. Kg: *See—*
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Wright, Raymond G. W. Potato processing apparatus. 4,526,075, Cl. 83-409.100.

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Wuhrer, Wolfgang, to Escher Wyss GmbH. Method of coupling coaxial shafts. 4,525,916, Cl. 29-446.000.
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Kaneda, Hidehiko; Inagaki, Natsuo; and Yamaguchi, Hitoshi, 4,526,239, Cl. 173-73.000.
Yamaha Motor Corporation, U.S.A.: *See—*
Lake, Leo C., Jr., 4,526,216, Cl. 141-348.000.
Yamaki, Kiyoshi; Suzuki, Hidetaka; Tanaka, Haruto; and Takeuchi, Yasuhisa, to Nissan Motor Company, Limited. System for maintaining an orientation of characters displayed with a rotatable image. 4,527,155, Cl. 340-727.000.
Yamamoto, Akito: *See—*
Takase, Sadao; Oshiage, Katsunori; Yamamoto, Akito; and Hosaka, Akio, 4,527,248, Cl. 364-565.000.
Yamamoto, Masaki: *See—*
Ijichi, Sadayoshi; and Yamamoto, Masaki, 4,527,280, Cl. 455-183.000.
Yamamoto, Yoshifumi: *See—*
Kakizaki, Shinobu; and Yamamoto, Yoshifumi, 4,526,401, Cl. 280-707.000.
Yamamoto, Yoshihiro; and Sakurai, Kenji, to NGK Spark Plug Co., Ltd. Ceramic material for cutting tools and process for the production thereof. 4,526,875, Cl. 501-87.000.
Yamamoto, Yuuji: *See—*
Kondo, Makoto; Nagasaku, Eiichi; Yamamoto, Yuuji; and Taya, Tosiki, 4,526,524, Cl. 418-255.000.
Yamamuro, Sigeaki: *See—*
Tanaka, Yoshikazu; Hirano, Hiroyuki; Abo, Keiju; Kumura, Haruyoshi; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,526,557, Cl. 474-18.000.
Yamana, Hajimu: *See—*
Kubota, Kanya; Yamana, Hajimu; and Takeda, Seiichiro, 4,526,658, Cl. 203-13.000.
Yamanaka, Isao, to Honda Giken Kogyo Kabushiki Kaisha. Choke lever device for a two-wheeled motor vehicle. 4,526,056, Cl. 74-489.000.
Yamanaka, Seisuke: *See—*
Onga, Makoto; Sase, Masatoshi; and Yamanaka, Seisuke, 4,527,190, Cl. 358-30.000.
Yamanari, Shozo; Horiuchi, Tetsuo; Sugisaki, Toshihiko; and Tominaga, Kenji, to Hitachi, Ltd. Containment vessel for a nuclear reactor. 4,526,743, Cl. 376-283.000.
Yamane, Hiroshi: *See—*
Nagashima, Masayoshi; Yamane, Hiroshi; Kikkawa, Shigeru; and Teraki, Yoshinori, 4,527,172, Cl. 346-76.0PH.
Yamashita, Keitaro: *See—*
Fukuda, Kozi; and Yamashita, Keitaro, 4,526,130, Cl. 118-657.000.
Yamatsuta, Kohji; and Nishio, Ken-ichi, to Sumitomo Chemical Company, Ltd. Fiber-reinforced metal composite material. 4,526,841, Cl. 428-614.000.
Yamauchi, Koji; Ito, Shoichi; and Tadokoro, Hiroyuki, to Hitachi, Ltd. Exposure amount control device for a copying machine. 4,527,093, Cl. 315-307.000.
Yamauchi, Tetsuo: *See—*
Norota, Susumu; Segawa, Yasuhiko; Kiriyama, Tsutomu; Emi, Shingo; Imoto, Tadasi; and Yamauchi, Tetsuo, 4,526,735, Cl. 264-27.000.
Yamazaki, Noriyuki: *See—*
Okita, Shin; Shimizu, Hideo; Yamazaki, Noriyuki; Sekiguchi, Fumio; Chimura, Toshihiko; and Shinagawa, Osamu, 4,527,208, Cl. 360-85.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photoelectric conversion device. 4,527,006, Cl. 136-244.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Non-single-crystal light emitting semiconductor device. 4,527,179, Cl. 357-17.000.
Yamazaki, Takashi: *See—*
Okano, Haruo; Yamazaki, Takashi; Horiike, Yasuhiro; and Horie, Hiromichi, 4,526,643, Cl. 156-345.000.
Yamazoe, Hisamitsu; Matsuura, Hideki; Ito, Katsunori; and Ohba, Masahiro, to Nippondenso Co., Ltd. Air flow measuring apparatus. 4,526,042, Cl. 75-861.750.
Yanagisawa, Midori: *See—*
Sato, Keiichi; Takeuchi, Yoko; and Yanagisawa, Midori, 4,527,230, Cl. 364-130.000.
Yang, Elmer C., to Pacific Scientific Company. Energy absorber. 4,526,047, Cl. 74-25.000.
Yank, Carl D.: *See—*
Ryan, Kevin P.; and Yank, Carl D., 4,526,766, Cl. 423-322.000.
Yasuda, Yutaka; Hirata, Yasuo; Murakami, Shuji; Nakamura, Katsuhiro; and Furuya, Yukitsuna, to Kokusai Denshin Denwa Co.; and NEC Corporation. Synchronization circuit for a Viterbi decoder. 4,527,279, Cl. 375-114.000.
Yates, Jan B.: *See—*
Swain, James C.; and Yates, Jan B., 4,526,516, Cl. 417-222.000.
Yeomans, Michael A.: *See—*
Ross, Barry C.; Johnson, Graham; and Yeomans, Michael A., 4,526,718, Cl. 260-239.00A.
Yeou, Victor: *See—*
Morizur, Jean Y. H.; and Yeou, Victor, 4,526,085, Cl. 91-6.000.
Yin, Chieh-Kung: *See—*
Kosrow, Robert L.; and Yin, Chieh-Kung, 4,526,115, Cl. 112-262.300.
Yohe, Thomas L.; and Kyriss, Karl M. Process for purification of contaminated groundwater. 4,526,692, Cl. 210-747.000.
Yokoe, Kazuo; and Sekine, Yukio, to Yoshida Kogyo K. K. Apparatus for manufacturing paper stringer tape for slide fastener. 4,526,567, Cl. 493-381.000.
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, to Green Cross Corporation, The. Trifluoromethyl substituted perfluoro quinolizines. 4,526,969, Cl. 546-164.000.
Yoldas, Bulent E.; and Lloyd, Isabel K., to Westinghouse Electric Corp. Rhombohedral nasicon compound and battery. 4,526,844, Cl. 429-30.000.
Yoneda, Tsutomu: *See—*
Nakagawa, Yoshinori; Yoneda, Tsutomu; and Matsuda, Shoji, 4,526,570, Cl. 604-20.000.
Yoneyama, Shinji: *See—*
Narishige, Eiichi; and Yoneyama, Shinji, 4,526,169, Cl. 128-303.00B.
Yoshida Kogyo K. K.: *See—*
Gartner, Karl, 4,525,963, Cl. 52-235.000.
Yokoe, Kazuo; and Sekine, Yukio, 4,526,567, Cl. 493-381.000.
Yoshida Kogyo K.K.: *See—*
Gartner, Karl, 4,525,962, Cl. 52-235.000.
Ishii, Susumu, 4,525,903, Cl. 24-429.000.
Yoshida, Masanobu: *See—*
Higuchi, Mitsuo; and Yoshida, Masanobu, 4,527,077, Cl. 307-443.000.
Yoshida, Mitsuo; Matsucka, Hiroyoshi; and Munekuni, Hajime, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for electrolysis of aqueous alkali metal chloride solution. 4,526,663, Cl. 204-98.000.
Yoshida, Nobuaki: *See—*
Ooi, Kazushige; Fujiwara, Shigekazu; Yoshida, Nobuaki; and Mori, Yoshio, 4,527,189, Cl. 358-29.000.
Yoshida, Tsutomu: *See—*
Kido, Yasuji; Yoshida, Tsutomu; Hamakado, Toshinari; Anno, Masami; Harada, Takahiro; and Motoki, Yoshinobu, 4,526,866, Cl. 435-68.000.
Yoshimoto, Teruko; Kawai, Mikio; and Kunimi, Hitoshi, to Nissan Motor Co., Ltd. Method of electrodepositing hexacyano-cobalt iron complex. 4,526,659, Cl. 204-56.00R.
Yoshimura, Yoshito: *See—*
Oshima, Noboru; Shimizu, Isamu; Yoshimura, Yoshito; Fujimaki, Tatsuo; and Tomita, Seisuke, 4,526,934, Cl. 525-332.900.
Yoshizawa, Akinori; Nakane, Yasuo; Hagimori, Kenji; Ohgai, Koya; Arisawa, Norisada; Takahashi, Tadashi; Maekawara, Hideaki; Imaizumi, Hiroyuki; Tsuchida, Hideyuki; Mieno, Eiichirou; and Sugino, Kenji, to Toho Zinc Co., Ltd.; and Yoshizawa, Akinori. Process for producing superfines of metal. 4,526,611, Cl. 75-0.50B.
Yoshizawa, Fukashi, to Olympus Optical Company, Ltd. Speed control apparatus for d.c. motor. 4,527,104, Cl. 318-331.000.
Yoshizawa, Shuji, to Tokyo Shibaura Denki Kabushiki Kaisha. Film-fabricating method and apparatus for the same. 4,526,805, Cl. 427-38.000.
Young, David E., to Smith International, Inc. Drilling head. 4,526,243, Cl. 175-195.000.

Young, Harlan S.: *See*—
Hatchadoorian, Edward; Ostapchenko, George J.; Patton, James L.; and Young, Harlan S., 4,526,831, Cl. 428-287.000.

Young, Murray M., to University of Waterloo. Bioconversion of agricultural wastes into proteinaceous animal feed. 4,526,791, Cl. 426-53.000.

Young, Russel L.; and Margerum, David E., to Armco Inc. Radio frequency induction heating device. 4,527,032, Cl. 219-10.61R.

Yu, Ho: *See*—
Ai, Daniel K.; and Yu, Ho, 4,526,223, Cl. 164-428.000.

Zagardo, Dominic V.: *See*—
St. John, Karl M.; and Zagardo, Dominic V., 4,527,193, Cl. 358-76.000.

Zahn, Norman E., III. Heads up sports timer with electronic time display. 4,526,473, Cl. 368-10.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Ehrlinger, Friedrich, 4,526,054, Cl. 74-467.000.

Zaltsman, Saul, to Silmet Ltd. Mixing capsule assembly. 4,526,472, Cl. 366-108.000.

Zampino, Michael J.: *See*—
Luccarelli, Domenick, Jr.; Mookherjee, Braja D.; Wilson, Richard A.; Zampino, Michael J.; and Bowen, David R., 4,526,798, Cl. 426-534.000.

Zara, Rodger A.: *See*—
Seitz, James P.; and Zara, Rodger A., 4,527,221, Cl. 361-379.000.

Zaruba, John V.: *See*—
Rosenwinkel, Donald A.; Breslow, Jeffrey D.; and Zaruba, John V., 4,526,376, Cl. 273-249.000.

Zavis, Wayne; and Saar, David A., to Black & Decker Inc. Universal electric motor speed sensing by using Fourier transform method. 4,527,101, Cl. 318-245.000.

Zbinden, Terry B., to Sperry Corporation. Clock source with automatic duty cycle correction. 4,527,075, Cl. 307-265.000.

Zeidman, Gordon G., to Tokyo Shibaura Denki Kabushiki Kaisha. Device for pressure fusing images on to paper in electrostatic copies. 4,526,460, Cl. 355-3.0FU.

Zeitler, Gerhard; Bittner, Gerhard; Faehndrich, Knud; and Rombrecht, Hans M., to BASF Aktiengesellschaft. Antistatic or electrically conductive thermoplastic polyurethanes: process for their preparation and their use. 4,526,952, Cl. 524-496.000.

Zembilis, Konstantinos: *See*—
Vayas, John; Zembilis, Konstantinos; and Zembilis, Lemonia, 4,525,892, Cl. 15-263.000.

Zembilis, Lemonia: *See*—
Vayas, John; Zembilis, Konstantinos; and Zembilis, Lemonia, 4,525,892, Cl. 15-263.000.

Zenith Electronics Corporation: *See*—
Midland, Richard W.; and Rozansky, Boris, 4,527,192, Cl. 358-67.000.
Sirazi, Semir, 4,527,194, Cl. 358-86.000.

Ziebarth, Warren S.; and Cater, Janet E. Abrasive finishing tool. 4,525,959, Cl. 51-391.000.

Ziegelbaum, Zelik. Exercising device suitable for physical therapy and the like. 4,526,365, Cl. 272-96.000.

Ziegler, Walter, to AMTEL Communications, Inc. Call concentrator with automatic line supervisor. 4,527,011, Cl. 179-18.0FC.

Ziegler, Walter: *See*—
Hambrecht, Juergen; Brandstetter, Franz; Ziegler, Walter; Muller, Wolfgang F.; Bronstert, Klaus; and Echte, Adolf, 4,526,927, Cl. 525-68.000.

Zievers, James F.: *See*—
Schmidt, Henry, Jr.; Cederholm, Allen E.; and Zievers, James F., 4,526,688, Cl. 210-323.200.

Zinser Textilmaschinen GmbH: *See*—
Schulz, Gunter; and Bothner, Jakob, 4,525,897, Cl. 19-260.000.

Zlotski, William J.: *See*—
Runkel, Manfred A.; Hsu, William W.; Singer, Anthony E.; and Zlotski, William J., 4,526,058, Cl. 74-531.000.

Zoecon Corporation: *See*—
Lee, Shy-Fuh, 4,526,608, Cl. 71-94.000.

Zuckerman, Jack M.; and Warmath, John, to Cut Rate Plastic Hangers, Inc. Garment-shaping hanger. 4,526,306, Cl. 223-88.000.

zur Hausen, Manfred: *See*—
Disteldorf, Josef; zur Hausen, Manfred; Hubel, Werner; and Kriebel, Gunter, 4,526,971, Cl. 546-186.000.

Zweegers, Petrus W. Device for mowing crop. 4,525,990, Cl. 56-295.000.

Zweig, Walter L., to AT&T Bell Laboratories. Digital phase and frequency comparator circuit. 4,527,080, Cl. 307-510.000.

501 DX Antenna Company, Limited: *See*—
Kamiya, Kimitaka, 4,527,136, Cl. 333-103.000.

501 KY K. Hartwall KB: *See*—
Hartwall, John, 4,526,124, Cl. 114-219.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF JULY, 1985

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bostock, James H.: *See*—
Taylor, Donald F.; and Bostock, James H., Re. 31,933, Cl. 166-120.000.

Christianson, Raymond A. Diaphragm assembly for the demand regulator of a breathing apparatus. Re. 31,932, Cl. 128-204.260.

Dynatron/Bondo Corporation: *See*—
Marston, Lloyd E., Re. 31,934, Cl. 222-181.000.

Fujitsu Ltd.: *See*—
Momma, Yoshinobu; Kawabe, Yunosuke; and Hataishi, Osamu, Re. 31,937, Cl. 357-50.000.

Hartwell Corporation: *See*—
Poe, L. Richard, Re. 31,935, Cl. 292-113.000.

Hataishi, Osamu: *See*—
Momma, Yoshinobu; Kawabe, Yunosuke; and Hataishi, Osamu, Re. 31,937, Cl. 357-50.000.

Kawabe, Yunosuke: *See*—
Momma, Yoshinobu; Kawabe, Yunosuke; and Hataishi, Osamu, Re. 31,937, Cl. 357-50.000.

Luick, Woodrow W. Convertible rotary mower-vacuum sweeper. Re. 31,930, Cl. 56-12.900.

Marston, Lloyd E., to Dynatron/Bondo Corporation. Disposable putty dispenser. Re. 31,934, Cl. 222-181.000.

Momma, Yoshinobu; Kawabe, Yunosuke; and Hataishi, Osamu, to Fujitsu Ltd. Semiconductor device and method for its preparation. Re. 31,937, Cl. 357-50.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Tomisawa, Norio, Re. 31,931, Cl. 84-1.010.

Nyi, Kayson: *See*—
Sperry, Peter R.; Wiersema, Richard J.; and Nyi, Kayson, Re. 31,936, Cl. 524-522.000.

Otis Engineering Corporation: *See*—
Taylor, Donald F.; and Bostock, James H., Re. 31,933, Cl. 166-120.000.

Poe, L. Richard, to Hartwell Corporation. Externally accessible adjuster for flush latches. Re. 31,935, Cl. 292-113.000.

Rohm and Haas Company: *See*—
Sperry, Peter R.; Wiersema, Richard J.; and Nyi, Kayson, Re. 31,936, Cl. 524-522.000.

Sperry, Peter R.; Wiersema, Richard J.; and Nyi, Kayson, to Rohm and Haas Company. Dispersing paint pigments. Re. 31,936, Cl. 524-522.000.

Taylor, Donald F.; and Bostock, James H., to Otis Engineering Corporation. High temperature well packer. Re. 31,933, Cl. 166-120.000.

Tomisawa, Norio, to Nippon Gakki Seizo Kabushiki Kaisha. Channel processor. Re. 31,931, Cl. 84-1.010.

Wiersema, Richard J.: *See*—
Sperry, Peter R.; Wiersema, Richard J.; and Nyi, Kayson, Re. 31,936, Cl. 524-522.000.

LIST OF DESIGN PATENTEES

Abe, Noboru; and Seiffert, Florian, to Matsushita Electric Works, Ltd. Electric shaver. 279,509, 7-2-85, Cl. D28-49.000.

Abernethy, Charles N.: *See*—
Akagi, Kenichi; Abernethy, Charles N.; Costello, John C.; Landry, Christian C.; Leitermann, Richard E.; and Urbanus, David S., 279,474, Cl. D14-100.000.

Adell, Robert, to U.S. Product Development Company. Combined pen and holder therefor. 279,481, 7-2-85, Cl. D19-42.000.

Akagi, Kenichi; Abernethy, Charles N.; Costello, John C.; Landry, Christian C.; Leitermann, Richard E.; and Urbanus, David S., to Digital Equipment Corporation. Keyboard. 279,474, 7-2-85, Cl. D14-100.000.

Altgelt, Carlos A.: *See*—
Dickie, Ronald; and Altgelt, Carlos A., 279,470, Cl. D14-10.000.

Barbeau, Raymond. Dumbbell. 279,495, 7-2-85, Cl. D21-197.000.

Barr, Josef J., to Jewelmasters, Inc. Jewelry embellishment. 279,463, 7-2-85, Cl. D11-86.000.

Bauer, James E.; and Shaak, Luther L., to Quickdraw Accessories, Inc. Cigarette paper dispenser. 279,508, 7-2-85, Cl. D27-51.000.

Beechuk, Timothy J., to Procter & Gamble Company, The. Bottle. 279,452, 7-2-85, Cl. D9-355.000.

Beechuk, Timothy J.; and Neu, Edwin F., to Procter & Gamble Company, The. Bottle. 279,453, 7-2-85, Cl. D9-376.000.

Brennan, Steven R. Illuminated sign. 279,485, 7-2-85, Cl. D20-17.000.

Bridgestone Tire Company Limited: *See*—
Nishio, Hideaki; Kojima, Hiroshi; and Kurima, Akira, 279,465, Cl. D12-147.000.

Brown, Philip J. Putter head. 279,497, 7-2-85, Cl. D21-219.000.

Burtoft, William K.: *See*—
Spreckelmeier, Lawrence E.; and Burtoft, William K., 279,501, Cl. D24-26.000.

Case, Kirt L., to Zimmer, Inc. Mixing apparatus. 279,499, 7-2-85, Cl. D24-22.000.

Chap, John P., to Selfix, Inc. Hanger bracket and hook therefor. 279,450, 7-2-85, Cl. D8-363.000.

Chicago Cutlery Consumer Products, Inc.: *See*—
Gangelhoff, Ronald J.; Kohler, Ray A.; and Sexton, Lee, 279,447, Cl. D7-151.000.

Clorox Company, The: *See*—
Fleming, Gregory J., 279,454, Cl. D9-377.000.
Fleming, Gregory J., 279,455, Cl. D9-389.000.

Colberg, Bonnie H.; and Ellis, Kathy E. Mother's nursing bib. 279,421, 7-2-85, Cl. D2-226.000.

Compaq Computer Corporation: *See*—
Papajohn, Ted, 279,475, Cl. D14-106.000.

Corning Glass Works: *See*—
Simson, Bruce R., 279,506, Cl. D26-113.000.

Cosden Technology, Inc.: *See*—
Fortuna, Vincent E., 279,451, Cl. D9-352.000.
Fortuna, Vincent E., 279,456, Cl. D9-389.000.

Costello, John C.: *See*—
Akagi, Kenichi; Abernethy, Charles N.; Costello, John C.; Landry, Christian C.; Leitermann, Richard E.; and Urbanus, David S., 279,474, Cl. D14-100.000.

Craft, Inc.: *See*—
Sutherland, Christopher C., 279,431, Cl. D6-300.000.

Crump, John M. Carrier for ski equipment. 279,425, 7-2-85, Cl. D3-36.000.

D. L. Auld Company, The: *See*—
Marrinan, Robert F.; and Orr, James D., 279,468, Cl. D12-190.000.

Danner, James. Chess piece. 279,487, 7-2-85, Cl. D21-52.000.

Danner, James. Chess piece. 279,488, 7-2-85, Cl. D21-52.000.

Dart Industries Inc.: *See*—
Spoeth, Carl R., Jr., 279,448, Cl. D7-325.000.

De La Rue Systems Limited: *See*—
Hilton, Graham H., 279,479, Cl. D18-3.000.

Dickie, Ronald; and Altgelt, Carlos A., to Ford Motor Company. Front panel for a motor vehicular combined radio and cassette player, or the like. 279,470, 7-2-85, Cl. D14-10.000.

Diffrient, Niels, to Knoll International, Inc. Combined seat and back support unit. 279,443, 7-2-85, Cl. D6-501.000.

Digital Equipment Corporation: *See*—
Akagi, Kenichi; Abernethy, Charles N.; Costello, John C.; Landry, Christian C.; Leitermann, Richard E.; and Urbanus, David S., 279,474, Cl. D14-100.000.

Downey, William P., Jr., to Fairchild Industries, Inc. Bucket seat. 279,437, 7-2-85, Cl. D6-375.000.

Dzak, Stephen. Support for mounting radios in a vehicle having bucket seats. 279,426, 7-2-85, Cl. D3-40.000.

Eberhart, Charles E.; Ettli, Karl P.; Lake, Brenton G.; and Rainbolt, Jack D., to NuDisc, Inc. Brake housing. 279,466, 7-2-85, Cl. D12-180.000.

Eberhart, Charles E.; Ettli, Karl P.; and Rainbolt, Jack D., to NuDisc, Inc. Brake lining carrier. 279,467, 7-2-85, Cl. D12-180.000.

Ed-Lin Stamping Company, Inc.: *See*—
Kairawicz, Raymond G., 279,510, Cl. D28-85.000.

Eddins, Fred D.; and Perry, Francis V., Jr., to Hasbro Industries, Inc. Toy glider. 279,492, 7-2-85, Cl. D21-89.000.

Eldon Industries, Inc.: *See*—
Evenson, Mel, 279,440, Cl. D6-462.000.

Ellis, Kathy E.: *See*—
Colberg, Bonnie H.; and Ellis, Kathy E., 279,421, Cl. D2-226.000.

Emery, Gerald. Holster purse. 279,427, 7-2-85, Cl. D3-42.000.

Ermanski, Albert G., to Wright Line Inc. Copyholder. 279,482, 7-2-85, Cl. D19-91.000.
Ettli, Karl P.: *See—*
Eberhart, Charles E.; Ettli, Karl P.; Lake, Brenton G.; and Rainbolt, Jack D., 279,466, Cl. D12-180.000.
Eberhart, Charles E.; Ettli, Karl P.; and Rainbolt, Jack D., 279,467, Cl. D12-180.000.
Evenson, Mel, to Eldon Industries, Inc. Suspended file holding rack. 279,440, 7-2-85, Cl. D6-462.000.
Fairchild Industries, Inc.: *See—*
Downey, William P., Jr., 279,437, Cl. D6-375.000.
Finger, Paul Alton, Jr. Connector for sign panels. 279,449, 7-2-85, Cl. D8-354.000.
Fixtures Manufacturing Corporation: *See—*
Gerner, James L., 279,438, Cl. D6-380.000.
Fleming, Gregory J., to Clorox Company, The. Combined bottle and cap. 279,454, 7-2-85, Cl. D9-377.000.
Fleming, Gregory J., to Clorox Company, The. Bottle. 279,455, 7-2-85, Cl. D9-389.000.
Foldes, Steven M., to Fun Footwear Co. Shoe and the like. 279,422, 7-2-85, Cl. D2-291.000.
Ford Motor Company: *See—*
Dickie, Ronald; and Altgelt, Carlos A., 279,470, Cl. D14-10.000.
Fortuna, Vincent E., to Cosden Technology, Inc. Packaging cup with a pedestal base. 279,451, 7-2-85, Cl. D9-352.000.
Fortuna, Vincent E., to Cosden Technology, Inc. Jar or the like. 279,456, 7-2-85, Cl. D9-389.000.
Fuchs, Donald N. Picnic table. 279,433, 7-2-85, Cl. D6-337.000.
Fudala, Walter N.; and Hatcher, David O., to Posting Equipment Corporation. Computer terminal workstation. 279,441, 7-2-85, Cl. D6-474.000.
Fun Footwear Co.: *See—*
Foldes, Steven M., 279,422, Cl. D2-291.000.
Gangelhoff, Ronald J.; Kohler, Ray A.; and Sexton, Lee, to Chicago Cutlery Consumer Products, Inc. Fillet knife. 279,447, 7-2-85, Cl. D7-151.000.
Gerner, James L., to Fixtures Manufacturing Corporation. Chair. 279,438, 7-2-85, Cl. D6-380.000.
Gibello, Carlo. Tennis racquet. 279,496, 7-2-85, Cl. D21-212.000.
Giorgetti, Carlo, to Giorgetti S.p.A. Arm-chair. 279,435, 7-2-85, Cl. D6-370.000.
Giorgetti, Carlo, to Giorgetti S.p.A. Arm-chair. 279,436, 7-2-85, Cl. D6-370.000.
Giorgetti S.p.A.: *See—*
Giorgetti, Carlo, 279,435, Cl. D6-370.000.
Giorgetti, Carlo, 279,436, Cl. D6-370.000.
Goldman, Frank, to Noz-L-Ad, Inc. Fuel nozzle ad display board. 279,483, 7-2-85, Cl. D20-10.000.
Goldman, Frank, to Noz-L-Ad, Inc. Fuel nozzle ad display board. 279,484, 7-2-85, Cl. D20-10.000.
Grunz, James H. Combined scraper, refinishing tool, wall paper tool and chisel. 279,514, 7-2-85, Cl. D32-49.000.
Halloran, William X. Intramedullary rod having a s-shaped cross section. 279,502, 7-2-85, Cl. D24-33.000.
Halloran, William X. Grooved intramedullary rod. 279,503, 7-2-85, Cl. D24-33.000.
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Clark, George B. Tubesheet in a separatory device cured using radio waves. T105,601, 7-2-85, Cl. 264-25.000.
Kennedy, George A.; and Lehr, James R. Process for producing phosphoric acid from low purity phosphate rock. T105,603, 7-2-85, Cl. 423-167.000.
Lehr, James R.: *See*—
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Mair, Alexander D. Thermal treatment of phosphate rock. T105,602, 7-2-85, Cl. 423-167.000.
Medina, Ramiro; and Sullivan, Jack M. Cyclotriphosphazatriene-derivatives as soil urease activity inhibitors. T105,605, 7-2-85, Cl. 435-168.000.
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Medina, Ramiro; and Sullivan, Jack M., T105,605, Cl. 435-168.000.
Uy, William C. Intractable poly(p-phenylenebenzobisthiazole) fiber. T105,604, 7-2-85, Cl. 428-364.000.

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459	4,526,103

CLASS 102

228	4,526,104
498	4,526,105

CLASS 104

138 G	4,526,106

CLASS 105

133	4,526,107
182 E	4,526,108
199 R	4,526,109

CLASS 106

1.05	4,526,618
35	4,526,619
203	4,526,620

CLASS 108

108	4,526,110

CLASS 110

245	4,526,111
345	4,526,112

CLASS 112

127	4,526,113
262.1	4,526,114
262.3	4,526,115
266.1	4,526,116
308	4,526,117
315	4,526,118
322	4,526,119

CLASS 114

39	4,526,120
73	4,526,121
106	4,526,122
210	4,526,123
219	4,526,124
347	4,526,125
365	4,526,126

CLASS 118

54	4,526,127
314	4,526,128
503	4,526,129
657	4,526,130
718	4,526,131
719	4,526,132

CLASS 119

17	4,526,133
51.13	4,526,134

CLASS 122

382	4,526,135
451.1	4,526,136
476	4,526,137

CLASS 123

25 E	4,526,138
26	4,526,139
41.15	4,526,140
51 BA	4,526,141
90.16	4,526,142
301	4,526,143
339	4,526,144
357	4,526,145
	4,526,146
440	4,526,147
	4,526,148
447	4,526,149
	4,526,150
468	4,526,151
478	4,526,152
480	4,526,153
502	4,526,154
525	4,526,155
552	4,526,156
595	4,526,157

CLASS 126

9 R	4,526,158
164	4,526,159
292	4,526,160
444	4,526,161
450	4,526,162

CLASS 127

1	4,526,621

CLASS 128

56	4,526,163
94	4,526,164
133	4,526,165
156	4,526,166
158	4,526,167
204.26	Re.31,932
303 B	4,526,169
303 R	4,526,168
303.1	4,526,170
305	4,526,171
322	4,526,172
335	4,526,173
	4,526,174
344	4,526,175
641	4,526,176
737	4,526,177
760	4,526,178
776	4,526,179

CLASS 130

27 R	4,526,180
	4,526,181

CLASS 131

109.1	4,526,182
336	4,526,183

CLASS 132

39	4,526,184

CLASS 134

21	4,526,622
	4,526,623
159	4,526,185
167 R	4,526,186

CLASS 135

66	4,526,187

CLASS 136

221	4,527,005
244	4,527,006
256	4,527,007

CLASS 137

3	4,526,188
68 A	4,526,189
119	4,526,190
206	4,526,191
244	4,526,192
296	4,526,193
385	4,526,194
512.1	4,526,195
557	4,526,196
596.2	4,526,197
624.2	4,526,198
625.31	4,526,199
625.47	4,526,200
625.63	4,526,201
625.66	4,526,202
627.5	4,526,203
637	4,526,204

CLASS 138

30	4,526,205
89	4,526,206
93	4,526,207
144	4,526,208

CLASS 139

46	4,526,209
59	4,526,210
430	4,526,211
449	4,526,212

CLASS 141

1E	4,526,213
59	4,526,214
83	4,526,215
348	4,526,216

CLASS 148

1.5	4,526,624
	4,526,629
2	4,526,625
6.14 R	4,526,626
12 B	4,526,627
	4,526,628
159	4,526,630
171	4,526,632
175	4,526,631

CLASS 149

109.6	4,526,633

CLASS 152

527	4,526,217

CLASS 156

64	4,526,634
89	4,526,635

94 4,526,636
137 4,526,637
159 4,526,638
182 4,526,639
242 4,526,640
247 4,526,641
311 4,526,642
345 4,526,643
4,526,644
350 4,526,645
361 4,526,646
406.4 4,526,647
497 4,526,648
629 4,526,649
642 4,526,650

CLASS 160

374.1 4,526,218

CLASS 162

65 4,526,651
110 4,526,652
259 4,526,653
4,526,654
360.1 4,526,655

CLASS 164

16 4,526,219
137 4,526,220
289 4,526,221
340 4,526,222
428 4,526,223

CLASS 165

1 4,526,224
104.11 A 4,526,225
109 R 4,526,226
124 4,526,227

CLASS 166

53 4,526,228
120 Re.31,933
4,526,229
236 4,526,230
270 4,526,231
339 4,526,232
377 4,526,233

CLASS 169

15 4,526,234

CLASS 172

126 4,526,235
4,526,236
647 4,526,237
780 4,526,238

CLASS 173

73 4,526,239

CLASS 174

42 4,527,008
4,527,009
52 FP 4,527,010

CLASS 175

72 4,526,240
76 4,526,241
94 4,526,242
195 4,526,243

CLASS 177

1 4,526,244
160 4,526,245
179 4,526,246
210 FP 4,526,247

CLASS 179

18 ES 4,527,012
18 FC 4,527,011
27 FH 4,527,013
81 B 4,527,014
84 R 4,527,015
90 B 4,527,016
115.5 PV 4,527,017
146 R 4,527,018
4,527,019
170.2 4,527,020

CLASS 180

89.1 4,526,248
219 4,526,249

CLASS 181

295 4,526,250

CLASS 187

9 R 4,526,251
20 4,526,252

CLASS 188

1.12 4,526,253
341 4,526,254

CLASS 192

3.58 4,526,255
40 4,526,256
48.2 4,526,257
88 A 4,526,258
91 A 4,526,259
106.2 4,526,260
4,526,261

CLASS 193

25 B 4,526,262

CLASS 194

1 N 4,526,263
4,526,264

CLASS 198

318 4,526,265
357 4,526,266
409 4,526,267
419 4,526,268
443 4,526,269
453 4,526,270
648 4,526,271
819 4,526,272

CLASS 200

5 A 4,527,021
8 R 4,527,022
11 C 4,527,024
11 G 4,527,023
61.08 4,527,025
78 4,527,026
144 B 4,527,028
144 R 4,527,027
148 B 4,527,029
306 4,527,030

CLASS 202

158 4,526,656

CLASS 203

3 4,526,657
13 4,526,658

CLASS 204

37.6 4,526,671
56 R 4,526,659
58 4,526,660
73 R 4,526,661
86 4,526,662
98 4,526,663
157.1 R 4,526,664
192 C 4,526,665
192 E 4,526,673
196 4,526,666
4,526,667
206 4,526,668
243 R 4,526,669
298 4,526,670
426 4,526,674
428 4,526,672

CLASS 206

229 4,526,273
231 4,526,274
4,526,275

CLASS 208

10 4,526,675
58 4,526,676
262 4,526,677

CLASS 209

2 4,526,678
3 4,526,679
166 4,526,680
214 4,526,681
337 4,526,682
423 4,526,683
552 4,526,276

CLASS 210

104 4,526,684
138 4,526,685
198.2 4,526,686
202 4,526,687
323.2 4,526,688
4,526,689
335 4,526,690
521 4,526,691
747 4,526,692

CLASS 211

46 4,526,277

CLASS 212

242 4,526,278

CLASS 215

32 4,526,279
100.5 4,526,280
211 4,526,281
252 4,526,282
256 4,526,283
329 4,526,284

CLASS 219

10.49 R 4,527,031
10.61 R 4,527,032
61 4,527,033
69 G 4,527,034
69 M 4,527,036
69 R 4,527,037
69 W 4,527,035
75 4,527,038
76.14 4,527,039
121 EB 4,527,044
121 LC 4,527,042
121 LD 4,527,040
121 LN 4,527,041
121 LQ 4,527,043
130.31 4,527,045
137 R 4,527,046
219 4,527,047
269 4,527,048
449 4,527,049
464 4,527,050

CLASS 220

7 4,526,285
22 4,526,286
260 4,526,287
264 4,526,288
304 4,526,289
415 4,526,290

CLASS 221

63 4,526,291
97 4,526,292
298 4,526,293

CLASS 222

47 4,526,294
82 4,526,295
107 4,526,296
4,526,297
130 4,526,298
146.4 4,526,299
146.5 4,526,300
153 4,526,301
181 Re.31,934
321 4,526,302
386.5 4,526,303
607 4,526,304
632 4,526,305

CLASS 223

88 4,526,306

CLASS 224

154 4,526,307
265 4,526,308

CLASS 226

33 4,526,309

CLASS 227

67 4,526,310

CLASS 228

119 4,526,311
157 4,526,312
180.1 4,526,313

CLASS 229

3.1 4,526,314
27 4,526,315
40 4,526,316
44 CB 4,526,317

CLASS 235

380 4,527,051
485 4,527,052

CLASS 236

49 4,526,318

CLASS 237

50 4,526,319

CLASS 239

43 4,526,320
229 4,526,321
404 4,526,322
453 4,526,323

CLASS 241

5 4,526,324
73 4,526,325

CLASS 242

43.2 4,526,326
84.2 G 4,526,327
107.4 A 4,526,328
155 M 4,526,329
199 4,526,330
218 4,526,331

CLASS 248

27.1 4,526,332
73 4,526,333
157 4,526,334
221.4 4,526,335
349 4,526,336
639 4,526,337

CLASS 249

197 4,526,338

CLASS 250

201 4,527,053
227 4,527,054
234 4,527,055
237 G 4,527,056
252.1 4,527,057
256 4,527,058
288 4,527,059
327.2 4,527,060
4,527,061
351 4,527,062
370 4,527,063
374 4,527,064
506.1 4,527,065
507.1 4,527,066
4,527,067
4,527,068
548 4,527,069
560 4,527,070

CLASS 251

1.3 4,526,339
38 4,526,340
63.5 4,526,341
131 4,526,342
367 4,526,343

CLASS 252

8.5 B 4,526,693
8.55 R 4,526,695
8.8 4,526,694
61 4,526,696
75 4,526,697
99 4,526,698
4,526,699
102 4,526,700
113 4,526,701
174.25 4,526,702
189 4,526,703
299.61 4,526,704
301.32 4,526,705
500 4,526,706
511 4,526,707
518 4,526,708
527 4,526,709
545 4,526,710
582 4,526,711
632 4,526,712
4,526,713

CLASS 254

9 C 4,526,344
93 R 4,526,345
122 4,526,346

CLASS 256

33 4,526,347
65 4,526,348

CLASS 260

112 B 4,526,715
112 R 4,526,714
112.5 R 4,526,716
4,526,717
239 A 4,526,718
346 R 4,526,719
397.4 4,526,720
404.5 4,526,721
410.5 4,526,722
4,526,723
463 4,526,726
465 D 4,526,727
502.5 R 4,526,728

CLASS 261

36 A 4,526,729
121 R 4,526,730

CLASS 264

2.7 4,526,732
5 4,526,731
12 4,526,733
13 4,526,734
27 4,526,735
53 4,526,736
112 4,526,737
176 F 4,526,738
228 4,526,739
259 4,526,740

CLASS 266

45 4,526,349
159 4,526,350
196 4,526,351
228 4,526,352
282 4,526,353

CLASS 269

93 4,526,354
328 4,526,355

CLASS 270

55 4,526,356

CLASS 271

18.2 4,526,357
34 4,526,358
94 4,526,359
122 4,526,360
186 4,526,361
4,526,362
268 4,526,363
272 4,526,364

CLASS 272

96 4,526,365

CLASS 273

1 GC 4,526,366
1.5 R 4,526,367
14 4,526,368
32 B 4,526,369
69 4,526,370
148 R 4,526,371
153 S 4,526,372
186 R 4,526,373
194 R 4,526,374
235 R 4,526,375
249 4,526,376

CLASS 277

9 4,526,377
12 4,526,378
80 4,526,379
4,526,380
4,526,381
4,526,382
152 4,526,383
153 4,526,384
4,526,385
188 R 4,526,386
198 4,526,387
206 4,526,388

CLASS 280

11.21 4,526,389
12 S 4,526,391
87.04 R 4,526,390
281 LP 4,526,392
404 4,526,394
406 R 4,526,393
408 4,526,395
515 4,526,396
612 4,526,397
615 4,526,398
655 4,526,399
701 4,526,400
707 4,526,401
817 4,526,402

CLASS 283

62 4,526,403
79 4,526,404
81 4,526,405

CLASS 285

18 4,526,406
42 4,526,407
47 4,526,408
114 4,526,409
149 4,526,410
305 4,526,411

CLASS 290

4 R 4,527,071
55 4,527,072

CLASS 292

113 Re.31,935
258 4,526,412

CLASS 294

88 4,526,413
143 4,526,414

CLASS 296

97 F 4,526,415
100 4,526,416
181 4,526,417
182 4,526,418

CLASS 297

153 4,526,419
218 4,526,420
232 4,526,421
243 4,526,422
440 4,526,423
473 4,526,424

CLASS 301

36 R 4,526,425

CLASS 303

6 C 4,526,426

CLASS 307

90 4,527,073
246 4,527,074
265 4,527,075
270 4,527,081
362 4,527,076
443 4,527,077
475 4,527,078
4,527,079
510 4,527,080

CLASS 310

313 B 4,527,082

CLASS 312

111 4,526,427

CLASS 313

25 4,527,083
93 4,527,084
128 4,527,085
485 4,527,086
487 4,527,087
493 4,527,088
4,527,089
592 4,527,090

CLASS 315

5 4,527,091
5.38 4,527,092
39.55 4,527,094
65 4,527,095
169.3 4,527,096
246 4,527,097
290 4,527,098
291 4,527,099
307 4,527,093
366 4,527,100

CLASS 318

245 4,527,101
254 4,527,102
293 4,527,103
331 4,527,104
444 4,527,105
483 4,527,106
642 4,527,107
687 4,527,108
715 4,527,109

CLASS 320

2 4,527,110
26 4,527,111
61 4,527,112

CLASS 324

52 4,527,113
71.1 4,527,114
73 R 4,527,115
77 B 4,527,116
121 R 4,527,117
133 4,527,118
158 F 4,527,119
166 4,527,120
207 4,527,121
226 4,527,122
254 4,527,123
309 4,527,124

CLASS 328

6 4,527,125
155 4,527,126

CLASS 329

122 4,527,127

CLASS 330

9 4,527,128
45 4,527,129

CLASS 331

36 C 4,527,130
116 FE 4,527,131

CLASS 332

7.51 4,527,132
11 D 4,527,133

CLASS 333

1.1 4,527,134
5 4,527,135
103 4,527,136
137 4,527,137

CLASS 335

81 4,527,138
256 4,527,139

CLASS 336

175 4,527,140
192 4,527,141

CLASS 337

105 4,527,142
242 4,527,143
407 4,527,144

CLASS 338

20 4,527,146
162 4,527,147

CLASS 339

14 R 4,526,428
17 C 4,526,429
45 M 4,526,430
45 R 4,526,431
75 M 4,526,432
75 MP 4,526,433
99 R 4,526,434
103 C 4,526,435
176 MF 4,526,436

272 R 4,526,437

CLASS 340

221 4,527,154
347 AD 4,527,148
365 R 4,527,149
541 4,527,150
554 4,527,151
572 4,527,152
4,527,153
727 4,527,155
753 4,527,156
825.01 4,527,157
961 4,527,158

CLASS 343

7 A 4,527,159
8 4,527,160
16 M 4,527,161
351 4,527,162
700 MS 4,527,163
713 4,527,164
778 4,527,165
840 4,527,166
4,527,167
901 4,527,168

CLASS 346

74.2 4,527,169
75 4,527,170
76 PH 4,527,171
4,527,172
135.1 4,527,173
136 4,527,174
140 R 4,527,175
141 4,527,176
159 4,527,177
207 4,527,178

CLASS 350

96.20 4,526,438
128 4,526,439
257 4,526,440
357 4,526,441
412 4,526,442
415 4,526,443
501 4,526,444
534 4,526,445
624 4,526,446
636 4,526,447

CLASS 351

153 4,526,448
205 4,526,449
206 4,526,450
211 4,526,451
243 4,526,452

CLASS 354

181 4,526,453
227.1 4,526,454
298 4,526,455
317 4,526,456
345 4,526,457
406 4,526,458

CLASS 355

3 FU 4,526,459
4,526,460
3 SH 4,526,464
14 R 4,526,461
38 4,526,462
83 4,526,463

CLASS 356

35.5 4,526,465
71 4,526,466
124 4,526,467
319 4,526,470
338 4,526,468
350 4,526,469
373 4,526,471

CLASS 357

17 4,527,179
23.6 4,527,180
23.7 4,527,181
24 4,527,182
30 4,527,183
50 Re.31,937
67 4,527,184
70 4,527,185

CLASS 358

1 4,527,186
19 4,527,145
23 4,527,187
4,527,188
29 4,527,189
30 4,527,190
4,527,191
67 4,527,192
76 4,527,193
86 4,527,194
120 4,527,195
158 4,527,196
168 4,527,197
185 4,527,198
213 4,527,199
4,527,200
224 4,527,201

CLASS 360

18 4,527,202
19.1 4,527,203
33.1 4,527,204
35.1 4,527,205
71 4,527,206
73 4,527,207
85 4,527,208
96.5 4,527,209
105 4,527,210
109 4,527,211
121 4,527,212

CLASS 361

56 4,527,213
96 4,527,214
124 4,527,215
156 4,527,216
179 4,527,217
233 4,527,218
323 4,527,219
332 4,527,220
379 4,527,221
415 4,527,222

CLASS 362

187 4,527,223
282 4,527,224
294 4,527,225

CLASS 363

41 4,527,226
54 4,527,227
98 4,527,228
126 4,527,229

CLASS 364

130 4,527,230
149 4,527,231
200 4,527,232
4,527,233
4,527,234
4,527,235
4,527,236
4,527,237
4,527,238
300 4,527,239
415 4,527,240
424 4,527,241
434 4,527,242
469 4,527,243
474 4,527,244
478 4,527,245
505 4,527,246
550 4,527,247
565 4,527,248
578 4,527,249
900 4,527,250
4,527,251
4,527,252
4,527,253

CLASS 365

51 4,527,254
154 4,527,255
4,527,256
184 4,527,257
185 4,527,258
189 4,527,259

CLASS 366

108 4,526,472

CLASS 367

27 4,527,260
76 4,527,261

CLASS 368

10 4,526,473
4,526,474
157 4,526,475
189 4,526,476
250 4,526,477
273 4,526,478
284 4,526,479

CLASS 369

33 4,527,262
46 4,527,263
77.1 4,527,264
244 4,527,265

CLASS 370

58 4,527,266
60 4,527,267
94 4,527,268

CLASS 371

3 4,527,269
11 4,527,270
20 4,527,271
25 4,527,272
38 4,527,273

CLASS 374

117 4,526,480
144 4,526,481

CLASS 375

1 4,527,275
23 4,527,276
82 4,527,277
97 4,527,278
114 4,527,279

CLASS 376

185 4,526,741
282 4,526,742
283 4,526,743
440 4,526,744
444 4,526,745
4,526,746

CLASS 381

51 4,527,274
71 4,527,282

CLASS 382

9 4,527,283

CLASS 384

104 4,526,482
106 4,526,483
133 4,526,484
486 4,526,485

CLASS 400

185 4,526,486
201 4,526,487
202.4 4,526,488
693 4,526,489

CLASS 401

183 4,526,490

CLASS 403

24 4,526,491
268 4,526,492

CLASS 404

105 4,526,493

CLASS 405

83 4,526,494
299 4,526,495

CLASS 408

179 4,526,496
240 4,526,497

CLASS 409

82 4,526,498

CLASS 410

31 4,526,499
48 4,526,500

CLASS 414

32 4,526,501
282 4,526,502
433 4,526,503
661 4,526,504
750 4,526,505

CLASS 415

98 4,526,506
170 B 4,526,507
172 A 4,526,508
174 4,526,509
175 4,526,510

CLASS 416

95 4,526,511
96 A 4,526,512

CLASS 417

5 4,526,513
61 4,526,514
63 4,526,515
222 4,526,516
355 4,526,517
420 4,526,518
490 4,526,519
559 4,526,520

CLASS 418

55 4,526,521
63 4,526,522
84 4,526,523
255 4,526,524

CLASS 419

8 4,526,747
49 4,526,748

CLASS 420

427 4,526,749
463 4,526,750

CLASS 422

37 4,526,751
56 4,526,752
4,526,753
82 4,526,754
90 4,526,755
104 4,526,756
106 4,526,757
122 4,526,758
143 4,526,759
185 4,526,760
224 4,526,761

CLASS 423

63 4,526,762
112 4,526,763
242 4,526,764
306 4,526,765
322 4,526,766
329 4,526,767
342 4,526,769
447.4 4,526,770
531 4,526,768
543 4,526,771
556 4,526,772
573 R 4,526,773
4,526,774
579 4,526,775

CLASS 424

1.1 4,526,776
20 4,526,777
52 4,526,778
62 4,526,779
66 4,526,780
70 4,526,781
85 4,526,782
114 4,526,783

CLASS 425

9 4,526,525
71 4,526,526
90 4,526,527
133.5 4,526,528

CLASS 426

5 4,526,790
53 4,526,791
56 4,526,792
72 4,526,793
128 4,526,801
258 4,526,794
297 4,526,795
465 4,526,796
520 4,526,797
534 4,526,798
553 4,526,799
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40 : 4,525,967
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41 : 4,525,913
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4,526,394
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4,527,117
4,527,272
42 : Re.31,936
4,525,909
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44 : 4,525,899
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45 : 4,526,246
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4,527,185
47 : Re.31,930
4,526,125
4,526,669
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4,526,730
4,526,822
4,527,111
48 : Re.31,933
4,525,915
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51 : 4,526,105
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4,527,073
53 : 4,525,911
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54 : 4,526,723
4,526,777
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55 : 4,525,875
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4,527,222

DESIGN PATENTS

06	:	279,423		279,460		279,486	27	:	279,433		279,477		279,483
		279,424		279,502		279,487			279,447		279,491		279,484
		279,430		279,503		279,488			279,485		279,493		279,508
		279,432		279,512	18	: 279,473	32	:	279,462		279,506	44	: 279,492
		279,434	09	: 279,464		279,499	34	:	279,427		279,507	48	: 279,466
		279,440		279,510	20	: 279,438			279,428	37	: 279,437		279,467
		279,444	12	: 279,425		279,514			279,504		279,449		279,475
		279,451		279,463	25	: 279,431			279,513	39	: 279,452		279,478
		279,454	13	: 279,421		279,474	36	:	279,429		279,453	49	: 279,420
		279,455		279,497		279,482			279,441		279,468	53	: 279,461
		279,456	17	: 279,426		279,505			279,442		279,500		279,469
		279,457		279,450	26	: 279,470			279,443		279,501	55	: 279,448
		279,458		279,480		279,481			279,446	42	: 279,422		

PLANT PATENTS

06	:	5,503									

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

01	:	T105,602		T105,603		T105,605	06	:	T105,601	10	: T105,604

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